The Iron Age

A Review of the Hardware, Iron and Metal Trades.

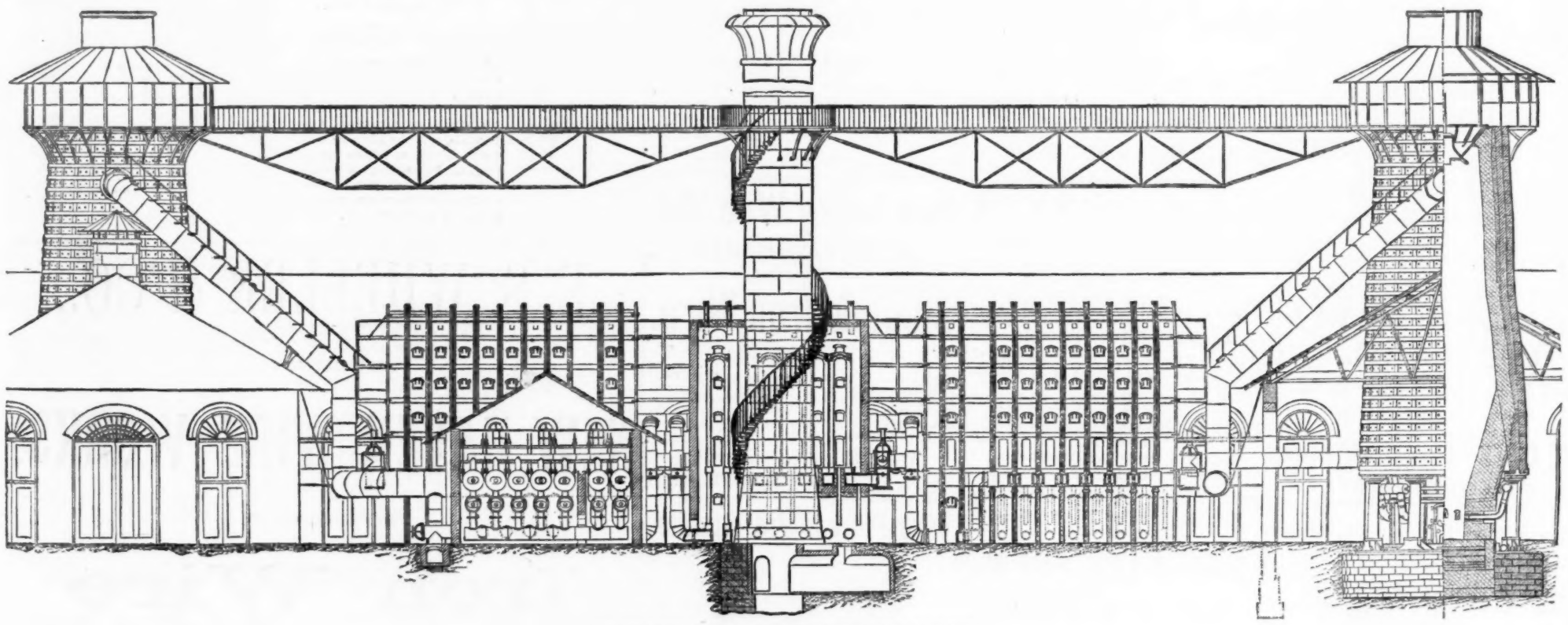
Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York.

Vol. XX: No. 19. *New York, Thursday, November 8, 1877.* *$4·50 a Year, Including Postage. Single Copies, Ten Cents.*

The Furnaces of the Bethlehem Iron Company.

We present on this page an illustration of the two new blast furnaces, Nos. 5 and 6, of the celebrated Bethlehem Iron Company, designed by and constructed under the superintendence of Mr. John Fritz. They differ in many details from the usual type of furnaces of their class in this country.

The stacks, as will be seen from the illustration, are placed so far apart (225 feet) that one large stove for each furnace and a smaller auxiliary one find ample space between them. The latter, partly visible, is shown in section. The intention was to get the necessary stock floor around each furnace in a long house (451 feet by 61 feet) which, with its straight railways, would run parallel to the line of furnaces, rather than to get this room less centrally by a narrow house running, with its necessarily curved tracks, in the other direction. This of course puts the engines on the other side of the stock house. Another motive for placing the furnaces so far apart was to avoid the serious inconvenience of a double casting house. The boilers, of which there are two, one for each stack and a supplementary smaller one between them, are placed in front of the stoves, between the two casting houses. The one to the left is shown in our illustration in section, the other is not seen.



THE NEW FURNACES OF THE BETHLEHEM IRON COMPANY.

The chimney is situated midway between the line of the furnaces and that of the boilers, at equal distances from both the stacks. The stacks, one of which is shown partly in section, have the following dimensions: No. 5 is 70 feet high and 17 feet 2 inches in diameter at the boshes, while with No. 6 the diameter at the boshes is 18 feet 6 inches, the hight being the same. The furnace blows through 5 working tuyeres, but there are besides two auxiliary or "fighting" tuyeres placed 16 to 18 inches above the former. These tuyeres, fitted in embrasures specially intended for them, are ready for immediate use, and serve to prevent derangements in the working of the furnaces. For an emergency, the furnaces have spare cinder notches, fitted with Luermann's closed front.

The furnace is not incased in a plate iron shell, as is the ordinary practice, but is inclosed by a system of rings and vertical bars, the thickness of which decreases toward the top of the furnace; an arrangement of bracing which is stronger, and permits repairs to be made more rapidly.

For the sake of ventilation, the outer walls are pierced by a large number of holes, which extend through the masonry to the loam which lies next to the lining.

The blast is supplied to the two furnaces illustrated and a third one, No. 2, by three engines of equal power, the air cylinders of which are 80 by 80 inches. They make 24 revolutions per minute.

The boiler setting is so arranged that expansion in every direction is provided for, so that the boiler is not injured by strains. The two main batteries contain 7 boilers each, the supplementary battery, 5.

The two main hot-blast stoves have 80 pipes each, the auxiliary stove has 50.

The ores used at the Bethlehem Works are Pennsylvania and Staten Island hematites, and Cornwall, Lake Champlain and New Jersey magnetites.

The ores for making spiegeleisen consist of the residuum of franklinite after the zinc has been removed by sublimation. The fuel used in smelting is anthracite from the Upper Lehigh region.

The furnaces Nos. 5 and 6 make 350 tons of 16 per cent. spiegeleisen per week each, and have made as much as 400 tons each per week for weeks together.

Abram S. Hewitt on the Paris Exposition.

The Hon. Abram S. Hewitt has just returned from a summer's visit to Europe. During his trip he passed more than a month in Paris, and became thoroughly conversant with the organization of the exhibition, its extent and progress up to the present time. In a conversation in regard to it he said:

The Paris Exposition is laid out on a larger scale than any previous Exhibition. The area covered by the buildings is larger than that of the Vienna Exposition, and more extensive than the Philadelphia Exhibition, which up to the present time is the largest international exhibition ever held. The Exhibition grounds are on the Champs de Mars, at precisely the same location as the old Exhibition of 1867. If a straight line were drawn through the center of the Arc de Triomphe down the river, it would pass over the Exposition grounds.

Street cars and omnibus lines run direct to the grounds, but the distance from the thickly populated portion of Paris is not difficult to walk. The new Exhibition grounds, being much more extensive than the former ones, extend on both sides of the river Seine, and are connected by the old Ponte Jeanne, which is to be used exclusively for the purposes of the Exhibition. In order that the street running parallel with the river on the Champ de Mars side may be kept open for public use and not interfere with the Exhibition, the roadway has been sunk to pass under the end of the Ponte de Iena. The Trocadero is on the opposite side of the Seine from the main buildings. The river bank rises steep, rocky and precipitous from the water's edge. Here is built the permanent building of the Exhibition, intended for the use of the judges, juries, commissioners, &c., of the Exhibition; also, for the special exhibitions, concerts, &c. The structure is of stone. Iron girders support the edifice, the architecture of which is magnificent, and equals anything in Paris, unless it be the Opera House. The Trocadero is in the form of a crescent. Just in front of the building the cliffs have been cut away and a splendid water-fall constructed artificially. Grottoes have been cut in the rocks and innumerable caverns, where an extensive aquarium will be arranged. I think that the external arrangement of the Trocadero is as fine a piece of landscape gardening as can be found anywhere.

The buildings or sheds of the Exhibition cover 56 acres. The ground is not divided off into various buildings for each branch of the Exhibition, having one building for machinery, another for agriculture, a third for horticulture, &c., as at Philadelphia. In Paris the whole Exhibition is under one roof or succession of roofs. These sheds are built of iron and glass, so erected that when the Exhibition is over they can be taken down and sold for railway stations or anything of that sort. The sheds are built on the longitudinal plan, each one being 2200 feet long. There are 12 of these sheds, each being 100 feet wide, connected by obtuse-angled roofs of glass. In the center of the sheds there is an open space, originally intended for a flower garden, but I believe that as the officers of the Exhibition found they were crowded, a portion of this open space was given to the city of Paris for its Exhibition. These buildings are now uncompleted, but they will undoubtedly be finished by the 1st of January. Speaking of the architecture of the Trocadero, I was very much pleased while in Paris to meet one of the old students of the Cooper Institute. He had studied architecture in the night school, and coming to Paris in search of work presented his diploma from the Institue and was made an assistant architect of the Exhibition buildings.

The management of the Exhibition is in the hands of men who are republicans. The monarchists of Paris seem to feel very little interest in the Exhibition. I conversed with the officers of the organization, and as republicans they feel extremely sensitive concerning the representation of America in Paris; they also feel that our absence from the Exhibition would evince a lack of interest on the part of America in the struggle of France for freedom. Germany will not participate in the Exhibition from motives of hatred and envy. Russia will not be represented because of the war in which she is engaged. There are many reasons why the United States should not fail to be represented in the Exhibition, putting aside the question of sentiment and the friendly ties which peculiarly connect the two nations. England is making every effort for the largest representation of any foreign nation. The Prince of Wales, who is at the head of the British Commission, is constantly traveling between London and Paris perfecting arrangements for an excelling representation from his nation. Our interest in the Exhibition, and the principal reason why we should not fail to participate therein, is because it will open a foreign market for our products. America made a poor representation at the Paris Exposition of 1867, and our show at Vienna was not one of which we could be excessively proud. I can state positively that we cannot be represented at the French Exhibition unless our government accepts the invitation of France in regular form, appoints a commission, and enters into the affair in a national spirit. If our government will do this thing, nearly every prominent American manufacturer will exhibit his wares. Our manufacturers at last are recognizing the fact that the strength of our home market is nearly expended, and we must depend for trade on competition with foreign manufactures. Our manufacturers see that our protective system has ceased to protect, and in order to compete successfully with foreign nations, we must place our goods on the same basis as theirs, and the price of our labor on the same financial basis. This is no aggression on the rights of workingmen, because if the price of labor be reduced the purchasing power of what labor can earn will be correspondingly increased.

The effect of these international exhibitions in general is obviously to enormously increase the commerce of the world. Since the first exhibition of 1851 was held, and the nations came together for the first time to examine the manufactures and products of each other, the commerce of Great Britain has quadrupled and our commerce has trebled in extent. Prior to that time there was an increase in the commerce of both nations, but that increase was exceedingly slow. By attending these exhibitions the manufacturers of the world have learned to adapt their products to the wants of each nation. The information obtained by this country at the Exhibition of 1867 in the manufacture of steel, has increased the steel in the United States $20,000,000 within the past five years. The information we obtained at Vienna about the manufacture of leather has increased the leather trade of this country to the extent of several million dollars within the past few years. Again, I say, leaving aside all question of sentiment, for the sake of our commerce and manufactures alone, we cannot afford to be unrepresented at the Paris Exhibition. The amount of the appropriation asked for is but as a drop in the bucket compared to the benefits which will result to us by participating in the Exhibition.

Bridge Building Notes.

The *Railway Age*, among other interesting notes, has the following in regard to what is now in progress in bridge building:

The Phœnixville Bridge Company are building a number of iron bridges in the line of the Montreal, Ottawa and Occidental Railway, in Canada, under contract made with the government, among which may be mentioned the following: On the Eastern Division, one at St. Ann's, 40 miles west of Quebec, having seven spans of 160 feet each, one at Batiscan, with four fixed spans of 160 feet each, and a draw (one of the best in Canada) of same length; one at the Three Rivers, half way from Quebec to Montreal, of five spans, each 219 feet in length, and 50 feet from the water. These will all be finished and ready for the running of trains by the middle of November, from Quebec to this point, beyond which none will be run till next spring.

On the Western Division, at Buck River, 7 miles east of Montreal, a 50-feet span has been finished, over a small stream, and near by two spans of 155 feet each, and one of 200 feet will soon be in place. At St. Rose one of five spans, of 155 feet each, is being built; at the Scholastic River a 50-feet span; at La Chute three spans of 104 feet each; at Calument a 50 feet span; at the River Rouge three deck spans of 150 feet each; at Ancheene Creek and Salmon Creek, one deck span each of 50 feet; at Salmon River a 100-feet span; at North Nation River three spans of 100, 150 and 200 feet; at Little Blanche River a 50-feet span; at River Blanche one span of 100 feet; across Au Leivereres River, at Buckingham, one span of 100 feet, and three of 150 feet each; at Little Upper Blanche a deck bridge of 50 feet; at Upper Blanche one span of 100 feet; at Gatineau four spans of 204 feet each.

All these bridges are of wrought iron, without welds, with iron floor beams and track stringers, wooden ties 8 by 8 and 8 inches apart, and the necessary guard rails and irons.

They are shipped to Canada in barges by canal, and have to pay a duty of 17½ per cent. on their cost. The Gatineau bridge, 50 feet high and 835 long, was raised and put in position ready for trains in 27 days after the false work had been put in and the iron delivered on the ground, with an average of 18 men per day. This company is also building a bridge on the Wabash Railway, two on the New London and Northern, is replacing the wooden bridge on the Great Western of Canada with iron, and has just completed six spans on the Portland and Rochester.

The company's superintendent of construction is Mr. Daniel R. Kelly, under whose superintendence most of its bridges are put in place.

The same paper also says: The westerly pier of the Poughkeepsie bridge is fixed on the solid gravel bed 97 feet below the surface of the water. Granite is beginning to arrive, and the work of building the stone pier will be shortly begun. The second caisson is sunk 75 feet below the surface. The depth of mud is greater than with the first pier, so that a foundation will be secured 112 feet below the surface. Both these caissons are immense timber structures, to be filled with solid concrete to a point 25 feet below the surface, where the granite pier will begin. All the piers for this bridge will be sunk to a depth greater than that of any bridge piers in the world. There are to be four piers in all, and two, it is said, will be completed to a point 20 feet above the water before the river freezes the coming winter. The hight of the piers above the water is to be 130 feet, and the depth of the truss 60 feet, so that the railroad track will be 190 feet above the water line.

The Severn Bridge.—The approach to this bridge is made by means of a viaduct consisting of 12 arches, to be carried 70 feet high. The spans are to be—one of 134 feet, 2 of 327 feet, 5 of 171 feet and 13 of 134 feet. The two principal spans, on the Forest shore across the navigable channel, are 70 feet above ordinary spring and high tides. Each of the piers of the 327 feet spans will consist of a cluster of 4 cylinders, 10 feet diameter, which are to be sunk into the river bottom 44 feet. For this purpose a caisson for compressed air is used. It is a chamber 5 feet in diameter, of ordinary boiler plate. The workmen first descend into an antechamber before entering the main chamber, in which the pressure is 28 lbs. to the inch. Seventeen piers have been founded in the bed of the Severn, as yet without any accident to the persons employed. Two-thirds of the Severn has already been spanned, and everything over that distance is ready for the laying of the permanent way. Provision has been made for the expansion and contraction of the girders by securing one end upon a plate of cast iron, bonded to a large block of stone; the other end is connected with a system of rollers to permit of expansion, space being left at the end of each girder to meet the action of the atmospheric influences. The contract price for the bridge was $950,000 and for the railway, with masonry work, $450,000.

Underground Telegraph Cables.—The London *Iron Trade Exchange* says: The first long underground telegraph cable existing, from Berlin to Mayence on the Rhine, about 400 English statue miles in length, has been manufactured and laid by Messrs. Felten & Guilleaume, of Cologne, also the cables crossing the various rivers on the route. By some electricians objections were made at first against the construction of long underground telegraph cables, fearing that the telegraphic communication could not be maintained on such lines. The superior working of the Berlin and Mayence underground lines, with both the Morse and Hughes apparatus, has proved these objections to be unfounded. The German government has, therefore, ordered from Messrs. Felton & Guilleaume the underground cable from Berlin to Cologne, 450 miles in length. This cable is now in course of construction at their works at the rate of five or six miles per day. There is no doubt that on all the principal telegraph routes in Germany the underground system will be introduced, the superior security and other advantages of such lines being self-evident.

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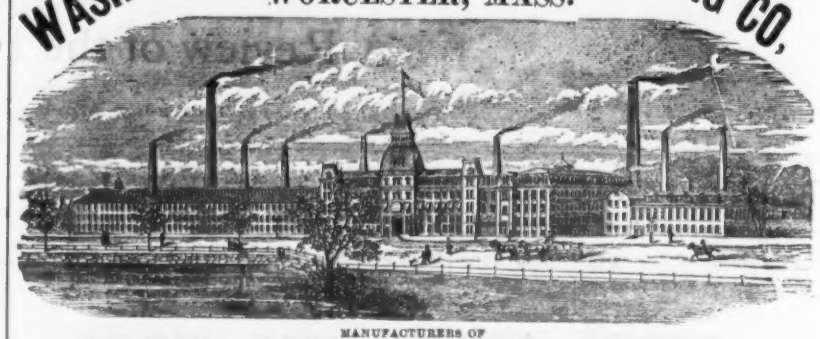

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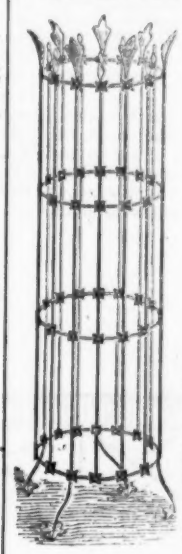

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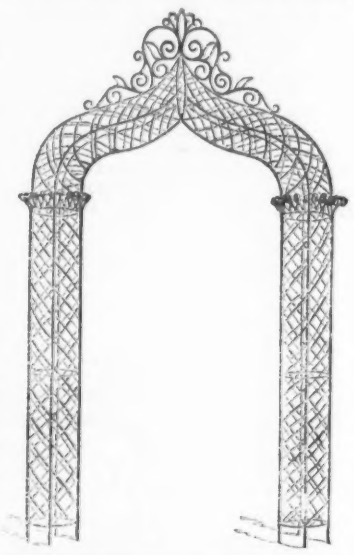

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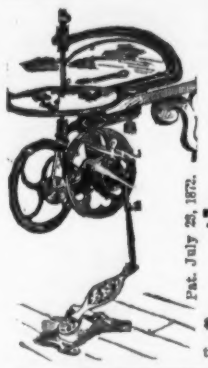

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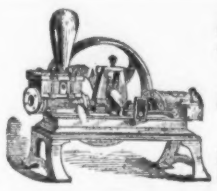

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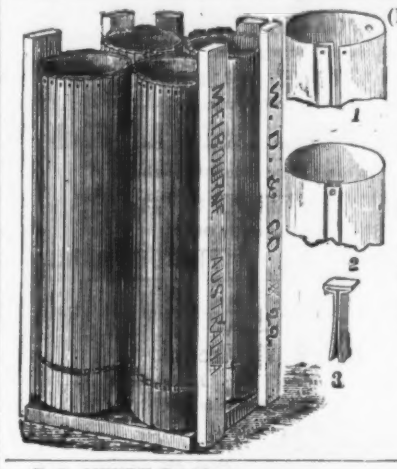

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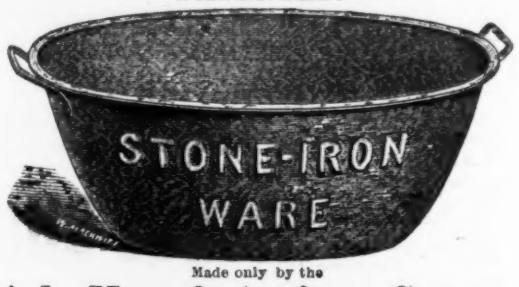

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Pope's Improved Cotton Tie.

The illustrations given herewith represent a new "Cotton Bale Tie." This tie has been perfected and the improvements patented by R. C. Pope, of the Pope Iron and Metal Co., St. Louis, Mo. The patents are dated respectively March 18th, April 3d and September 18th, 1877. It is calculated alike for plantation baling or for the "Compress," and the facility with which connections are made and the great strength of the fastening, are important points of advantage. It is light, weighing only two ounces, and yet strong enough to resist the heaviest tension strains either in the rough handling to which the bales are often subjected in shipping from the plantation, or the strain resulting from the extreme pressure now used in the "Compress."

Figure 1 shows the tie as locked, and Figure 2 shows the two parts in the act of being brought together. It will be observed that when the parts are approaching, a guide cone on one enters a suitable socket of the other, and insures the proper relative position of the parts. When engaged, a swell of the one part rests in a concave recess of the other, forming a sort of dovetail joint, preventing the parts from pulling asunder. The strain also comes upon side bars of one part that rest in recesses of the other.

A very ingenious device is made use of to prevent the parts from separating before the strain comes upon the tie. This consists in framing one or both parts with a twist or "wind," so that the bond acts as a spring to hold the parts together in their locked position. We understand that the company have sold this season upward of 75 tons of these ties.

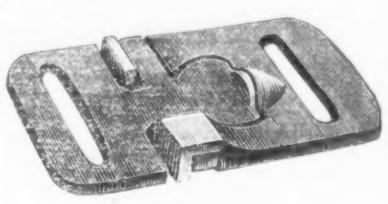

Fig. 1.

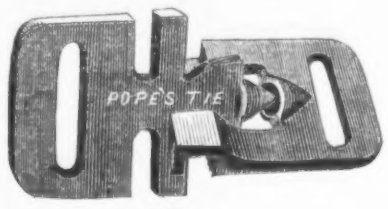

Fig. 2.

POPE'S IMPROVED COTTON TIE.

Ancient Roman Mining Laws.

An interesting Roman inscription lately discovered in Portugal, does something toward making up for the rather unaccountable paucity of contributions from that country to Latin epigraphy. The inscription, which is on a bronze tablet, comes from the copper mines of Aljustrel, in the south of the kingdom, which are now worked as they were by the Romans, and as it is believed they were in times still earlier. By the form of the letters it is assigned to about the Flavian period. What the inscription gives us is a loose page of the by-laws which regulated the concession to various contractors—we hesitate to say, or syndicates—of certain dues and privileges in the district attached to the mines. The contents imply reference to a community grouped around this special industry, and which could scarcely have been spread over a very wide area. Our notice must be correspondingly restricted; the terms of several of the clauses provoke discussions respecting Roman law and usage, imperial and provincial, on which archæologists must expatiate in free fields of their own elsewhere. The public dues of 1 per cent. upon sales by auction are let for a year to a contractor, who is assumed to have a partner and an agent; his interests are secured when either "shafts" or merchandise are sold by private agreement, after having been put up at auction without result. Another contract is opened for the fees of the public crier at sales of property in general, the contractor being allowed the right of sub-letting. Here we remark that in the enumeration of valuables, which finishes curtly with "slaves or anything else," while the sexes of mules and asses are expressed by the usual change of termination, horses are distinguished from mares by an entirely different word (*mulos, mulass; asinos, asinas; caballos, equas*). *Caballus,* that would scarcely be known to the purely classical reader but for a semi-sarcastic line of Horace, was destined to usurp the glory of being the name of the most beautiful of animals—as *cavallo, caballo, cheval,* &c.—in all the languages that affiliate on Latin. Let the philologists look to it; we have it notified here that the *lingua rustica* had already taken the direction which ominously precluded any confusion between *equus* and *æquus*—between the equitable and the equestrian. The contractor for the baths is to be allowed sufficient fuel to heat the hypocausts, and may sell the *recisamina*—a new word—that are useless for that purpose, but nothing more; and he must clean and grease all bronze fittings once a month, and return them in good condition at the end of the year—allowance made for fair wear and tear. The baths were to be open for women from daylight to the seventh hour, or midday, and thence from the eighth hour to the second of night; from 2 to 9 p. m. for men. The payment for women was an *as*; for men, perhaps because more numerous, half that sum. Soldiers, freedmen and slaves connected with the works and children bathed free. The water is to be duly supplied to the edge of the bath in one case, in another to the hight of the top frog—"*ad summam ranam,*" apparently an aquatic ornament of the outflow. The privilege of barbering was also made contributory to the public revenue, which reaped a harvest from the chins of the miners. Slaves might minister as barbers to their masters or to each other, but woe to the *circitor,* the tramp who used shears or razor without license!—for every such illicit service he paid double fine to the contractor, and to him forfeited the instruments of his misdeeds—his *ferramenta.* The restricted area to which these regulations applied is shown by the intimation that, though the contractor might have more skilled assistants than one, one might be sufficient (*unum pluresve artifices idoneos recipito*). We can only mention further the contract for the fulling of garments—*rudia vel recusata.* The last is one of several words which must be interpreted without help from dictionaries of any Latinity. *Lapides lausiæ,* in another clause, can be translated "slate" by the present Portuguese vernacular, *pedras de lousa.* A clause is declaratory of the exemption of the profession of schoolmaster from public charge.—*The Athenæum.*

Sanitary Drainage in Germany.

One of our correspondents who has visited several of the principal German cities reports, as the result of his personal experience, that sanitary matters are in even worse condition there than with us. In general, he says, their water closets are good enough, with the single fault of the absence of water. Their earth closets are good enough except for the absence of the earth. The lack of water to flush the closets may be attributed to two circumstances beyond the control of the maker of the closet—lack of a constant water service through pipes in the building, and lack of sewers to receive the contents of the closet. The largest cities in Europe, including Berlin, depend largely upon street pumps for their water supply, and as these were until quite recently their only source of potable water, few of the older buildings have water pipes in them.

In Berlin, sewer pipes are now being put down, but it is doubtful, judging from their size, whether they are expected to receive any of the night soil from the houses. This difficulty is avoided in various ways, the most common method being to build a number of old-fashioned privies over a vault in the court, the vault being emptied semi-occasionally by scavengers.

In Heidelberg you will often see the surface water flowing down a narrow opening, which you suppose at first leads to a sewer; this is a false, delusive hope. At distances of a few rods along the side of the streets holes are dug some 5 feet deep and 4 feet in diameter. In each of these is placed a wooden cylinder about 3½ feet in diameter for a core; the space outside is filled in with stone and cement. When the cement has had time to set the core is removed, and this bottomless cistern is covered with a flat stone containing a slit an inch wide and a foot long, through which the water runs from the gutters. These cesspools supply a sufficient drainage to keep the roadway and sidewalk dry.

As regards the closets in Heidelberg, many of them are provided with air-tight casks into which they discharge their contents. Each house has two of these casks, and one or more teams are continually employed removing them when full and replacing them by empty ones. This system of course precludes the use of water for flushing the closets, else the casks, which are not as large as a flour barrel, would require removal one or more times every day, hence the abundant supply of pure water is no aid in this respect. It is needless to add that siphons and other devices for rendering closets odorless are scarcely applicable to these.

Geological Survey of the Territories.

Within a very short time the several divisions of Professor Hayden's Geological Survey of the Territories will return to the headquarters of the organization at Washington, laden with the rich results of another successful expedition to the far West. The achievements of this survey are increasing in importance each year, and the developments made by it within the last ten years have not been equaled by any similar organization either in this country or Europe. The survey has been making an examination of the country north of the 40th parallel, and the width of the area reaches from Rawling's Springs to Ogden, and from the 40th parallel to the Yellowstone Park. Mr G. R. Bechler, in charge of one division, occupied the country along Snake River and near the Park. Mr. Bechler will complete about 8,000 square miles. Mr. Henry Garnett, in charge of another division, occupied the country about the sources of Green River, and covers about 10,000 square miles. Mr. G. B. Chittenden explored the region along the lower Wind River and Sweetwater; his area also comprises 10,000 square miles Mr. A. D. Wilson, in charge of the triangulation party, traveled across and over the entire country examined by the different divisions, and constructed a net-work of primary triangles, occupying and locating all the prominent mountains within the territory surveyed. The expedition this year will be able to reveal some most important information, as the country examined proved to be rich in mines and resources for farming, the climate excellent, and the whole region quite accessible. Large collections of fossils of various kinds, as well as minerals, were made; numerous botanical and natural history species were also collected. The office work will soon commence. The preparation of the reports for Congress will be pressed forward and the final results reduced to form—all in time to prepare for the exploration of other unknown fields next year. The real value of Professor Hayden's labors are virtually unknown to the people, simply because his reports are not put in general circulation.

In a large carriage manufactory in England, a few months since, the directors wished to introduce an American machine for the manufacture of wheels. A number of workmen were inclined to use it, as they could earn higher wages and their work was less laborious, but they were ordered by their trades unions not to use it, and the machine was, consequently, put aside. Since then American machine-made wheels have been imported, and their importation increases every day.

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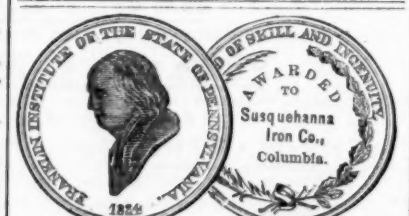

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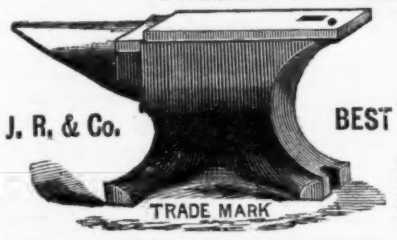

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New Patents.

We take from the records of the Patent Office in Washington the following specifications of certain patents, lately issued, which will be found interesting:

IMPROVEMENT IN DEVICES FOR TESTING CARBONIZATION OF METALS.

Specification forming part of Letters Patent No. 185,647, issued to Charles M. Ryder, of Cleveland, Ohio.

In the drawing, Fig. 1 represents a plan view of an electro-magnet for magnetizing the pieces of metal; Fig. 2, a view, in elevation, of an apparatus embodying my invention.

A is a piece of steel, or of homogeneous iron or other ferruginous product, which has a given or ascertained amount or percentage of carbon. A′ is a piece of similar metal, the percentage of carbon of which is not known, but is to be ascertained. The piece,

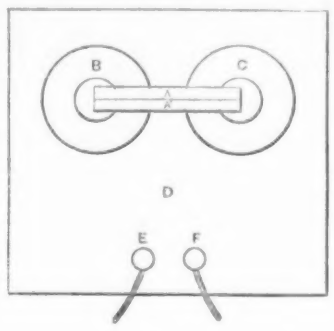

Fig. 1.

A′, of metal is taken either from the furnace during the process of conversion, or from the finished product, as is desired. The two pieces, A A′, are then first tested by a needle to ascertain whether it has magnets, which is shown by its attraction to one pole, and a repulsion of the other pole. If neutral, it attracts either pole equally well. If found to be neutral, it is placed side by side with piece, A, of known carbonization, on the poles of an electro magnet, as shown in Fig. 1, B C. The magnet is then connected with a galvanic battery, thus permanently magnetizing the pieces A A′. They are then removed from the poles of the battery and placed upon an indicator, as shown in Fig. 2.

This indicator consists of a scale graded in both directions from the zero or central point. Opposite the zero or central point is suspended the needle, G, that in the drawing being represented suspended from a point, J, above. It is, as above stated, hung so that its central or pivotal point shall be immediately opposite the zero point on the scale K.

The piece A, which has a known carbonization, is placed at its corresponding point on the scale. Thus, if it is known that the piece A has one-half of 1 per cent. of carbon, it is placed so that its end shall be, as indicated, opposite the number .50. The piece A′, the percentage of which is to be ascertained, is placed at the other end of the scale. These two pieces will then exert an influence upon the needle, causing it to come to an equilibrium when the quantity of carbon in the 2 pieces is unequal at some point, varying from the zero point. The piece A′ is then slid along the scale K until, by its approach toward the needle, its point G will be brought to an equilibrium immediately opposite the zero point of the scale. The end of the piece A′ will then rest opposite an indication on the scale which represents its exact percentage of carbon. Thus the piece A′, as shown in Fig. 2, would possess 60-100 of 1 per cent. carbon.

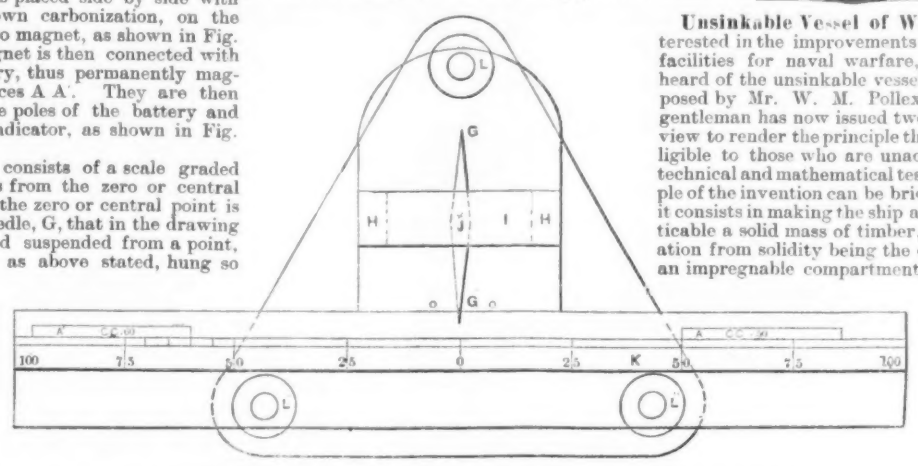

Fig. 1.—IMPROVEMENT IN DEVICES FOR TESTING CARBONIZATION OF METALS.

In this way, having a piece of metal of given or known percentage of carbon, this machine furnishes a mechanical means for immediately determining the exact percentage of carbon that exists in any other piece of metal.

The essential feature of this invention consists in the employment of a needle in connection with a graded scale and the pieces of metal, the percentage of carbon in one of which is known, these several elements being so placed in relation to each other that the relative attractions of the needle by the pieces A A′ shall indicate the percentage of carbon in the unknown piece; and it is apparent that this may be done either by sliding the unknown piece toward the needle until the needle shall rest at the zero point, in which case the piece itself would mark its percentage of carbon by its position on the scale K, or it might be ascertained by fixing the unknown piece at the same distance from the needle that the known piece is fixed, and the needle, by its superior attraction toward either piece, might, when at equilibrium, point upon a suitable scale to the figures indicating the percentage of carbon in the unknown piece.

Claim.—1. A mechanical means for determining the percentage of carbon in ferruginous metals, consisting of a pointer, A, 2 equal reversed scales on opposite sides of the pointer, 1 for the piece of unknown percentage of carbon, the other for the piece of known carbonization, said scales being graduated to the different percentages of carbon, and having their common zero point immediately beneath the pointer when unattracted.

2. A mechanical means for determining the percentage of carbon in ferruginous metals, consisting of a pointer and scale graduated to the percentages of carbon, whereby metals placed on opposite sides of the needle, at equal distance therefrom, will, by their varying attraction of the needle, cause it to point on the scale to the percentage of carbon that exists in the unknown pieces, substantially as set forth.

IMPROVEMENT IN THE CONSTRUCTION OF REVERBERATORY FURNACES.

Specification forming part of Letters Patent No. 189,486, issued to John Morrison, of Pittsburgh, Pa.

Figure 1 is a longitudinal vertical mid-section. Fig. 2 is a transverse vertical section on line *y′ y*.

This invention relates to improvements in furnaces of that class in which the combustion of the fuel is aided by the introduction of heated air, having reference particularly to furnaces for puddling, heating, boiling and other forms of reverberatory furnaces; and it consists in the construction of the various parts and their combination, substantially as hereinafter fully described and claimed.

The accompanying drawings show the invention as applied to an ordinary puddling furnace, in which A is the front wall, B the back wall, C the flue-end wall, D the roof, E the fire chamber, F the fire bridge, G the flue bridge, H the hearth, *h* the bottom plates, and I the usual air chills surrounding the puddling chamber.

The chill is made as usual or in the form of a closed box open at the ends, and in two separate sections, one lying in the flue bridge G, extending out to an opening, *a*, in the front wall of the furnace, and to the rear wall, where it ends in an uptake, *b*, rising to a horizontal flue passing along in the rear wall toward the fire till it reaches a point in line with the fire bridge F, where it rises vertically to the roof, delivering into an air chamber, J, at its side, constructed on the roof of the furnace. The other section of the chill communicates with an opening made in the rear wall at the level of the chill, whence the air passes on through the chill toward the fire bridge, F, reaching which it continues in that section of the chill which traverses this bridge till it reaches the front wall, at which point it rises vertically, by an uptake, into chamber J in the roof. By this means the functionaries of the chills are undisturbed, the cold air entering as

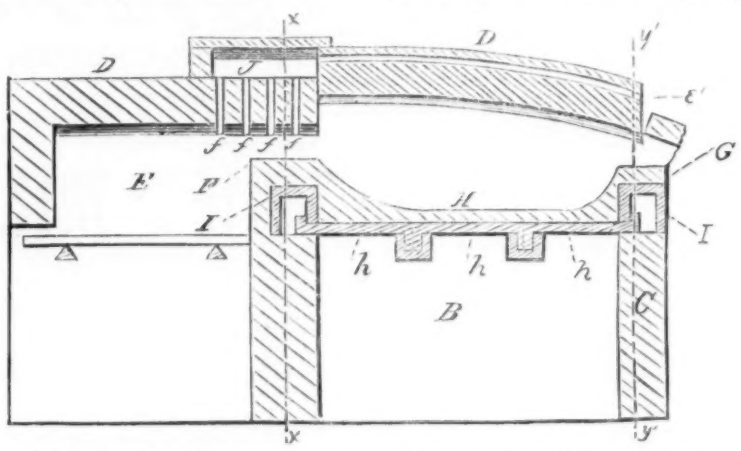

Fig. 1.—IMPROVEMENT IN THE CONSTRUCTION OF REVERBERATORY FURNACES.

usual; but a new function is added, and I hold that their efficiency is increased, because there necessarily is a stronger draft and greater supply of cold air, while at the same time a simple and ready air heater is thus made of the chills by causing them to deliver their air into the chamber J and thence to the furnace.

That part of the roof above the puddling chamber, which is the hottest part of the furnace, has a number of longitudinal flues, *e′*, taking into the roof at the end next the chimney, and passing on into chamber J.

The arch above the bridge F has one or more transverse slits or openings, *f*, delivering the heated air from chamber J in thin sheets upon the products of combustion, and by making two or more openings a cumulative effect is secured, because whatever gases fail of ignition at the first meet more air at the second, and so on, till it is almost impossible to get gases or smoke past all of them. The air at this point serves as a chill upon the roof.

Another feature in the arrangement introduces air into the fire chamber roof by means of a number of flues, which, like the other flues, deliver into chamber J or directly into slits *f*. By means of dampers suitably located, full control of the draft and air may be secured, just as with the ordinary furnace. Thus, all the air passing through the chills, while it cools them, absorbs their heat

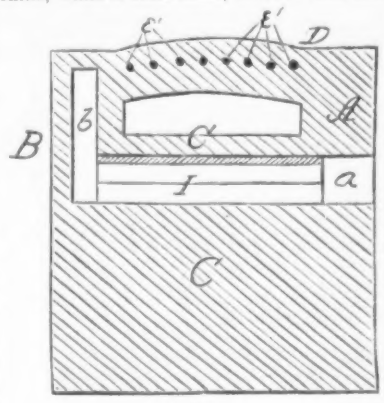

Fig. 2.

and is utilized in completing combustion—likewise with the roof, the object being to keep all the parts as cool as may be, and using their heat in heating the air necessary to complete combustion.

Claim.—The improved metallurgic furnace hereinbefore described, having the two air-heating flues taking respectively into the front and rear walls, each passing half way around the hearth through the boshes, and then rising to the crown, where they communicate with an air-gathering chamber extending transversely across the crown, and from which the air current passes into the furnace through a series of two or more cumulative delivering slits constructed in the crown.

Unsinkable Vessel of War.—Those interested in the improvements of our present facilities for naval warfare, have already heard of the unsinkable vessel of war proposed by Mr. W. M. Pollexfen, and that gentleman has now issued two letters with a view to render the principle thoroughly intelligible to those who are unacquainted with technical and mathematical tests. The principle of the invention can be briefly explained; it consists in making the ship as near as practicable a solid mass of timber, the only deviation from solidity being the construction of an impregnable compartment in the center for carrying the armament and machinery. The rectangular hold or space is of course arranged to be of suitable size, and Mr. Pollexfen even proposes to provide that the ship shall continue to float although the reserved compartment shall be completely filled with water, and still have buoyancy to spare. He points out that such a ship would be invincible, for though completely swamped, and the engine or other rooms flooded for a time, she could be managed with her sails, and remain as formidable as any sailing war vessel until her damage was repaired. But this is not all; the whole of the exposed portion of the hull being constructed of solid timbers, Mr. Pollexfen suggests, with much show of plausibility, that even a torpedo would not disable his ship, since at most it would, in all probability, only rend away, without detaching, one or two of the outside timbers, so that no less than a whole succession of torpedo attacks would render the vessel unseaworthy. He remarks that timber can be prepared so as to resist fire to a great extent, and if this preparation were found to interfere with the required weight of the timber in any particular instance, another method can be resorted to—that of rendering the exposed timbers fireproof.

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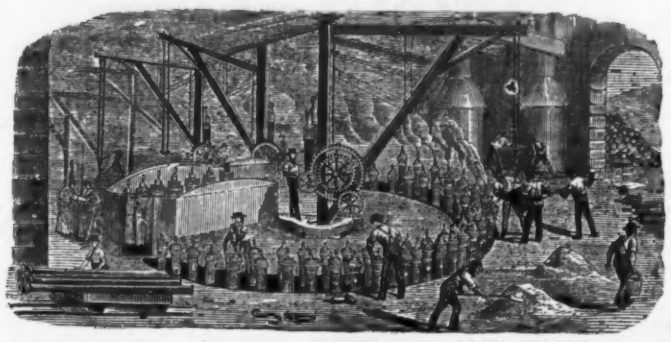

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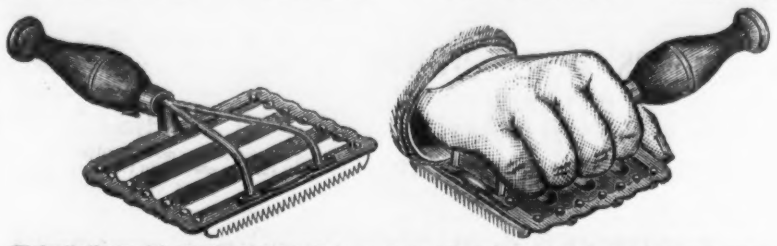
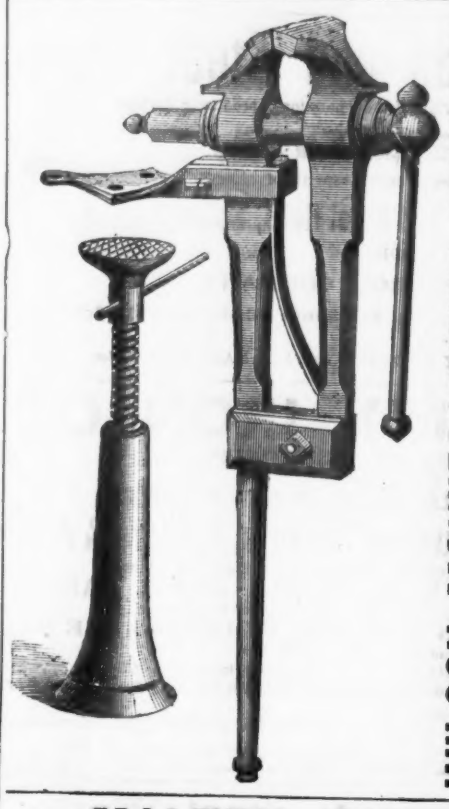


We invite the special attention of the trade to our Patent "Superior" Curry Comb, which is the *best* and *most complete* side handle Comb having a grasp over the back now in existence, and which for *neatness, strength* and *durability* has no *equal*. Give them a trial and you will be convinced that they are *Superior to any* Curry Comb in the market. They are neatly put up in paper boxes of one dozen each and packed 15 dozen in a case. For sale by the jobbing Hardware, Saddlery and Woodenware trade.

HOTCHKISS' SONS, Bridgeport, Conn.

Sample and Warerooms, **113 Chambers St., N. Y.**



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NEW LONDON, CONN.,

MANUFACTURERS OF

SOLID BOX VISES,

Composition and Steel Roller Bushings, Fishing Swivels, Coffee Mills, Jack Screws, Turning Lathes, Clamp Heads and Screws.

Parallel Bench Vises, Bench Screws, Vise Screws, Box Chisels, Rivets, Sheaves, Block Pins, Rigger's Screws, Calkers' Tools, Tackle Blocks and

GENERAL HARDWARE.

OFFICE & WORKS, New London, Conn.

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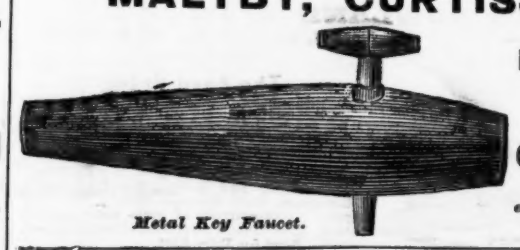

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Manufacturers of

Metal Key Maple & Rosewood

FAUCETS.

Also Manufacturers of

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THE BUELL PEG FLOAT and the Victor Knife Sharpener.

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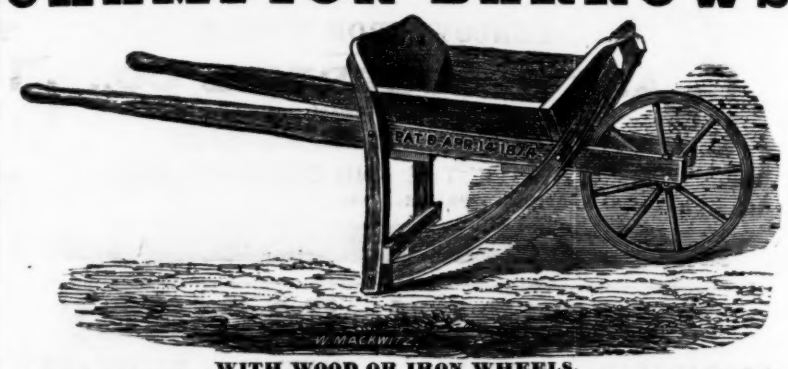
CHAMPION BARROWS.



WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin to dealers. We are prepared to furnish them in large quantities. Manufactured by

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Shattuck's Union and Counter Scales.
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GLOBE NAIL COMPANY,

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Pointed Polished & Finished Horse Shoe Nails.

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All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

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PUMPS.

HYDRAULIC RAMS,

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IN THE

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Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867, and Philadelphia, 1876, accompanied by Report of Judges.

Descriptive Catalogues and Price Lists sent when requested.

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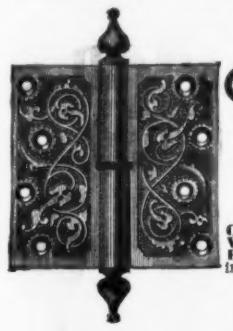
UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE;



Cast Fast & Loose

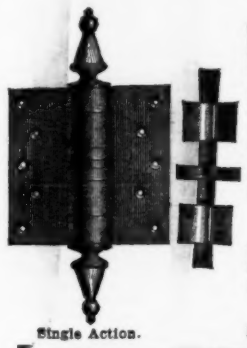
Drilled and Wire Jointed.

Japanned, Figured Enameled, Nickel Plated and Real Bronze Butts. Also a full line of

IRON & BRASS PUMPS,

Cistern, Well, and Force Pumps, Yard, Drive Well, Garden Engine and Steam Boiler Pumps, Hydraulic Rams, etc., and all with the most modern improvements.

Centennial Spring Hinges.



Single Action.

This Hinge has **two** flat coil springs, very powerful It has a heavy **solid** pintal, giving much less friction than a **hollow** pintal. It has broad, solid bearings in the knuckle, which do not wear down readily and let the door sag. It is Fast Joint, therefore can be used for either right or left hand. By actual test it has an average of 50 per cent. more power than other Spring Hinges in common use of same size.

☞ **Fine Castings a Specialty.**

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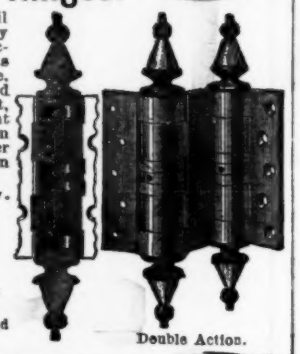
Heaton & Denckla, 507 Commerce St., Phila. (Butts.)

Send for Illustrated Catalogue and Price List.



Double Action.

THE IMPROVED

HOWE SCALES

In Competition with the World, at Philadelphia, 1876.

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the highest honors to the Howe Scales:

1st. For their Protected Bearings (the Howe is the only Scale with protected bearings), which makes the Scale *DURABLY ACCURATE.*
2d. For their Strength.
3d. For their Simplicity.
4th. For their economy in construction.
5th. For their first-rate material and workmanship.
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The Improved Howe Scales

MADE BY THE

BRANDON MFG. COMPANY, of Brandon, Vt.,

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago. 116 Main St., Cincinnati. 612 N. Third St., St. Louis.
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V. S. W. PARKHURST, Cor. Market & Fremont Sts., San Francisco, Cal.
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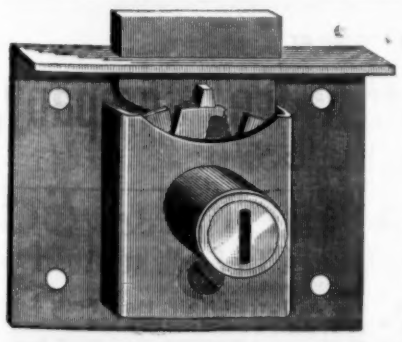

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Drawer Lock.

THE

"STANDARD."

Applicable also to Cupboards, etc.

Made wholly of Brass, and finely finished. Each Lock has two flat, steel, nickel-plated Keys.

Dealers desiring to examine this Lock will receive a sample without charge, by addressing

The Yale Lock Mfg. Co.

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The Largest Pump Works in the World.

Over 800 Different Styles.

PUMPS, STEAM PUMPS, ROTARY PUMPS, CENTRIFUGAL PUMPS, PISTON PUMPS,

for Tanners, Paper Mills, Fire Purposes, suitable for all situations imaginable.

Also, HAND FIRE ENGINES.

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MARCUS C. HAWLEY & CO., San Francisco and Sacramento, Cal., General Agents for the Pacific Coast.

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W. S. BLUNT'S

Universal Force Pumps.

Secured by Letters Patent.

These Pumps have enormous power, and are for the house or for *out-door wells* of any depth. They are constructed with special regard to strength, ease of working and durability. They can be immediately changed from lift to force pumps, and the air chamber can be revolved, so as to allow the handle to work at any desired angle with the spout. Having close tops, they cannot be tampered with. Attention is called to our new elegant pattern **Deep Well Non-Freezing Fire Pump.** Also, **Blunt's Sand Vacuum Chambers**—a complete protection against sand or gritty water in *dug or driven wells, pits, mines and rivers.* For *hand* or *steam pumps*, all sizes, from 1¼ inch to 4 inch suction pipe.

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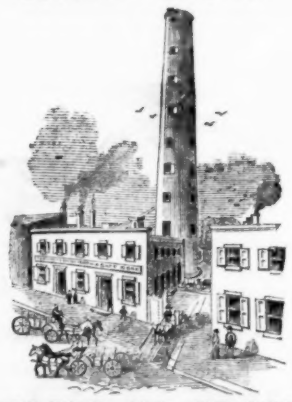
The Oldest Shot Tower in America.

FOUNDED JULY 4, 1808.



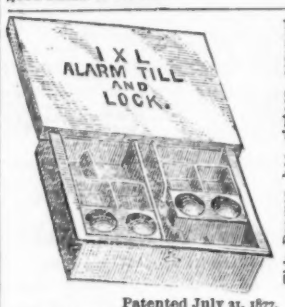
THOMAS W. SPARKS,

Manufacturer of

American Standard Drop and Buck Shot and Bar Lead.

121 Walnut Street, Philadelphia.

Premium awarded by the Judges of the Centennial International Exposition for uniformity and general good finish of Pellets.



This Drawer has sixteen compartments. For efficiency, durability and convenience it is proved to be superior to any in the market, while it has this advantage over all others, that any one lock fits any one drawer. It is a common lock—when set, a combination lock—and is also an alarm lock.

Patented July 31, 1877.

For sale at all the principal Hardware Houses in New York and elsewhere, also in the Manufacturer's Office, *24 Dey St., New York.* Price Lists furnished to the trade only.

SAUSAGE MEAT CHOPPERS.

Kinyon's Patent, the "BOSS,"

3 Power Sizes, *4 Hand Sizes.*

KINYON BROS.,

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Japanese Paper Ware.

Centennial Award

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Jennings Bros.

for the manufacture of the Japanese Paperware, Water Pails, Chamber and Commode do. (Slop Jars Foot Baths and Water Carriers), Bowl and Pitcher Pans, Basins, Cuspadores, Spittoons, &c., &c.

Warehouse, 372 Pearl St., N. Y. City.

Trade supplied

The Self-Closing Faucet Litigation.

A decision of much importance to brass founders, dealers in plumbers' goods, &c., has been reached in the United States Circuit Court, district of Connecticut, in the case of Joseph Zane *et al.* vs. Peck Bros. & Co. The points of Judge Shipman's decision are:

The patent of Nathaniel Jenkins for a self-closing faucet, issued June 27, 1865, is not anticipated by the French patent of Chretien Morand, dated November 14, 1851.

Where the change in the faucet made it more simple and economic, and was not formal, but in a certain degree structural, patentable invention was exercised, notwithstanding the general priciple of operation was old.

It was not simply the "carrying forward or new or more extended application of the original thought," and was not "a change only in form, properties or degree." (Smith *vs.* Nichols, 21 Wall., 112.)

The following is the text of Judge Shipman's decision:

This is a bill in equity to restrain the defendants from the infringement of letters patent for a self-closing faucet, which were issued to Nathaniel Jenkins on June 27, 1865, and which have been duly assigned to the plantiffs. The defendants admit infringement, and the sole question is as to the novelty of the alleged invention. The validity of the patent has been sustained by decree of the circuit court for the district of Massachusetts, in a case where other anticipatory devices than those which are here replied upon were set up in defense. The present defendants are the licensees of the defendants in the Massachusetts case.

The invention consisted in opening a self closing faucet by means of a quick-threaded screw follower, the threads of which are inclined at so great a pitch that, when the power to turn the screw is removed, the pressure of the water and of a spiral spring under the valve forces the valve to its seat, where it is held by the pressure of the water. The specification says that another part of the invention consists in combining with the valve and screw follower a swivel, so that the rotary movement of the spindle shall not be imparted to the valve, which shall have only an axial movement, and thus twisting or friction of the valve shall be prevented. This swivel connection of spindle and valve is frequently used in structures where rotation of the valve is not desired. The faucet has gone into extensive use.

The claims of the patent are:

1. The screw follower H, in combination with the valve of a self-closing faucet, substantially as set forth and for the purpose described.

2. The combination of the swivel P, screw follower H, valve K and spring O, substantially as and for the purpose described.

Self-closing faucets opening by means of a lever, and also by means of a quick-threaded screw, have long been known. The invention in this case is the combination of quick-threaded screw, valve and spring, substantially as described in the specification.

In the pre-existing English patent of Moses Poole, dated April 15, 1845, and in the specification of William Thomas Cheetham left with the English Commissioner of Patents March 14, 1860, and in the English patent of Thomas Melling, dated October 6, 1857, no spring was used, and by reason of that omission these devices did not anticipate the Jenkins invention.

The French patent of Chretien Morand, dated November 14, 1851, is chiefly relied upon by the defendants as anticipatory of the plaintiffs' patent. The Morand device was designed in part to prevent what is called the "water hammer," or the unpleasant sound which is caused by the reaction of the water when the valve is suddenly closed. The faucet is of two parts of unequal size; the induction-way is of larger size than the eduction-way. There are two valves also of unequal size. The outer valve is in rigid connection with and is turned by a quick-threaded screw spindle. This valve is so connected with the inner one that the inner valve is guided longitudinally, and is forced to its seat by the same rotation of the screw follower which operates upon the outer valve. The connection of the inner valve with the spindle is not by means of a swivel joint. Below the inner valve is a spring which, with the pressure of the water, causes the valves to be closed when the power that turns the screw is removed. The patentee remarks that while he prefers two valves, "it will be understood that in certain cases he can employ but one." The manner in which the faucet will then be constructed is not described. By the use of two valves the body of water which is between the valves forms a cushion, which checks the force of the sound or of the blow of the water hammer when the faucet is suddenly closed.

The principal elements which are employed to produce a self-closing faucet—to wit, the screw follower with a quick-threaded screw, valve and spring—are found in both the Morand and the Jenkins patents; but the double valves of Morand, and the general method in which the mechanism of the inner valve and the spring was arranged, with reference to each other and the water-way, caused his faucet to be cumbersome and lacking in simplicity and economy. It was a contrivance of many parts, and lacked general utility. Jenkins omitted one of the valves, and of course discarded the connection between the two, and made the passageways for the entrance and discharge of the water of the same size, and connected the valve and the screw-follower by a swivel, and generally materially simplified the construction and arrangement of the valve and spring mechanism. He thus made a simple and economical self-closing faucet, which has gone into general use. He has produced the old result of Morand in a more economical and beneficial manner. The invention of Jenkins is subsidiary to that of Morand; but he has essentially changed the Morand device in such manner that, by the change, the thing which is produced is practically a new structure, and his improved device is therefore patentable.

This change was not merely formal, but was, to a certain extent, a structural change and modification of the parts of the Morand faucet, which change required inventive and not merely mechanical skill, and required a sufficient exercise of the inventive faculty to justify the grant of an exclusive right to the use and sale of the article which was produced.

It was not simply the "carrying forward or new or more extended application of the original thought," and was not "a change only in form, properties or degree." (Smith *vs.* Nichols, 21 Wall., 112.)

Let there be a decree for an injunction and an account.

England's Competitors.

The British *Trade Journal* says: Our American friends are prosecuting the business war with a spirit and resolution which bid fair to carry all before them. On every hand are they making their presence felt, and there is scarcely an important branch of British industry but what is menaced by the invader. It is evident that no stone will be left unturned or means untried, to secure for the products of American workshops an assured footing in the English and Colonial markets, and past experience has taught us that once the Americans seize a point of vantage they hold to it with invincible tenacity. The plan of their industrial campaign is fast developing itself, and has thus far been attended with no inconsiderable success. Explain it how we may, the broad fact remains that American calicoes have sold in Manchester, and what is more, are still selling there and elsewhere in the cotton districts. Sheffield, of steel renown, has seen the saws and cutlery of Philadelphia and Pittsburg flaunted in her face, and has actually come to experience a sensation from the placing of a moderate transatlantic order for rails. Coventry looks amazed while the machine-made watches of Waltham supplant her productions, and the Bermondsey tanners declare with doleful iteration their inability to supply an article that can compete with American leather "at the price." Birmingham has been deposed from her position as the armory of the world by the factories of Rhode Island, and, unkinder cut, the merchants of the "hardware village" receive explicit indents from the colonies for American hardwares and "notions." Suggestive and sufficiently startling all this, and yet we are only just beginning to feel the effects of that American competition which but a few years back was contemptuously dismissed as a mere bugbear. The day of illusion is now past, however, and the conviction is forcing itself home that our manufacturers will, in the not very remote future, be severely taxed to hold their own against competitors enjoying advantages of which they know full well how to make the best use. With that inventive genius which seems to be their special inheritance, the Americans adapt machinery to all purposes, and their labor-saving contrivances bring down the cost of production to an irreducible minimum. The boundless wealth of their country in coal and iron, those backbones of productive toil; its splendid yield of raw material, and unique resources generally, make it the natural home of manufacturing industry. And when to these advantages is added the powerful prop that protection affords, it is inevitable that America should force its way into the van of manufacturing nations. A letter that we publish elsewhere expresses the writer's belief that, in the production of certain classes of goods, the United States are quite competent to hold their own without protection. Instances are adduced where the intrinsic worth and reliability of their productions enable them to compete with and beat the manufactures of other nations. Into this large question we cannot now enter, although we are inclined to think that the writer of that letter allows his patriotic partiality for things American to somewhat obscure his judgment, as when he institutes an unfavorable comparison between the unrivaled tools of Whitworth and those of a States' firm. That the Americans *do*, however, excel in some branches of industry cannot be denied; and it is equally certain that, both in this country and the colonies, there is promising scope for a wide range of their manufactures. They are not oblivious of the fact; and, as some proof of their resolve to extend the field of operations, we may point to our advertising pages. It is evident that they mean to make a resolute bid for Old World patronage, and those who are first afield will be pretty sure to reap the most solid advantages.

Wages in the time of James II.—At the Easter Sessions, 1688, the rates of wages allowed by the justices of Bucks were entered in the records. A "Chiefe Bayliffe, or Hyne in Husbandry," was allowed to receive £6 a year "in the Chilterne," and £5.10/ "in the Vale." Every other manservant in husbandry, if above twenty years of age, £4.10/ in the Chiltern, and £4 in the Vale. If under twenty and above sixteen, £3 in the Chiltern, and £2.10/ in the Vale. Boys between twelve and sixteen might receive £1.13/ 4d. and £1 respectively.

"Cooke mayds and Dary mayds" were to have £2.10/ a year; other maid-servants not more than £2. "Mowers or reapers of corne or grasse" might receive 1/ 2d. by the day without meat or drink, or 6d. with meat or drink. Mowers of grass by the acre were paid 1/ 2d. Men hay-makers had 10d. a day without meat or drink, or 5d. with meat and drink. Women hay-makers, 6d.—Mowers of barley, peas, beans, or oats had 1/ 4d. or 8d. Laborers at other times might be paid 8d. or 4d. from Lady Day to Michaelmas, and 7d. or 3d. from Michaelmas to Lady Day. "Free Masons" might receive 1/ 8d. a day without meat and drink. "Rough masons, carpenters, ploughrights, (*sic*) bricklayers, playsters, and tylers," were to have 1/ 2d. from Lady Day to Michaelmas, and 1/ from Michaelmas to Lady Day. If supplied with meat and drink they were to have 8d. all the year round. Gardeners and thatchers were paid at the same rate; but a tailor got only 6d. a day with meat and drink, or 10d. without; and a "spinner" had only 4d. without meat and drink. These rates appear to have remained without material alteration until the reign of George I.

USE THE BEST.

Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

Granted for *After more than Fourteen Years of Competition* Superior Goods.

McCaffrey's Philadelphia Hand Cut Files and Rasps

Have Proved their Great Superiority.

Silver Medal. Highest Premium.

Messrs. ARNOLD & CO.,
310 California St., San Francisco,
Sole Agents for Pacific Coast.

AUBURN FILE WORKS,

Superior Hand-Cut

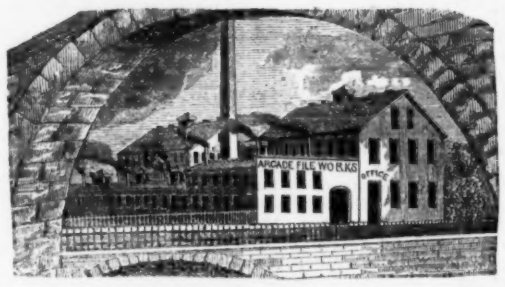
FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

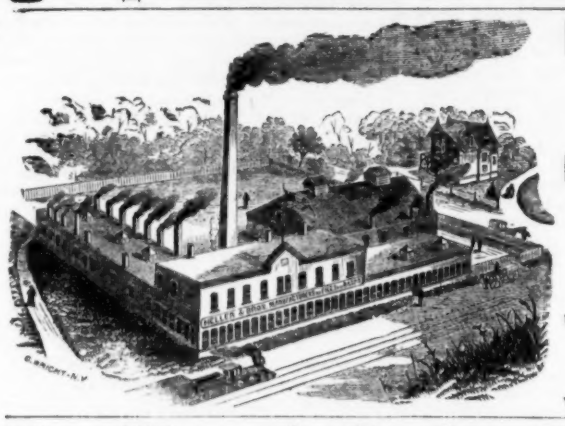
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y

ESTABLISHED 1848.

C. T. DRAPER & CO. (Sing Sing, N. Y.) Manufacturers of SUPERIOR HAND CUT



FILES and RASPS Made from Best ENGLISH CAST STEEL. Quality guaranteed by written warranty when required.



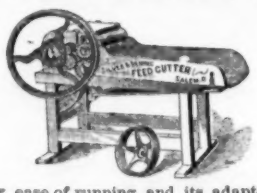
Heller & Bros.,
NEWARK, N. J.,
Manufacturers of
Best American Hand Cut Files & Rasps.

Guaranteed to give entire satisfaction.

For sale by all leading Hardware and Iron houses.

The Silver & Deming Feed Cutter

HAS NO SUPERIOR IN THE MARKET.



Celebrated for its great capacity, ease of running and its adaptability to all kinds of work. Our power Cutters are fitted with an **Improved Safety Fly Wheel**, and in the event of iron or other hard substances getting into the feed the Fly Wheel revolves but the Knives stop, thereby securing safety to the Machine and to the operator.

Send for circulars giving Prices and full Particulars.

Liberal discount to the trade.

SILVER & DEMING MFG. CO.,
Salem, Ohio.

GOLD MEDAL
Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.
RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non extensible base, which supports the leather and secures

PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

BENJAMIN F. BADGER & SON, Manufacturers,
Badger Place, Charlestown, Mass

FILES & RASPS,

Established 1868.

Best Cast Steel. HAND-CUT. Manufactured by

JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

Putnam's Government Standard
FORGED
Hammer Pointed
HORSE SHOE NAILS,
READY FOR DRIVING.

Manufactured from the best of **NORWAY** Iron, and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,
NEPONSET, MASS.

Scroll Saws

SAW BLADES, WOOD, DESIGNS AND MATERIALS.

FLOWER POT BRACKETS,
Aquaria, Flower Stands, &c.

AGENCY FOR

S. H. & E. Y. Moore, Anti-Friction Barn Door Hangers, &c.
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Send for prices and specialties.

G. WEBSTER PECK,
Manufacturers' Agent,
110 Chambers St., N. Y.

CHAS. E. LITTLE, 59 Fulton St., N. Y.

1760. 1876.

Solid Cast Steel Pump Augers

Solid Cast Steel Augers & Reamers

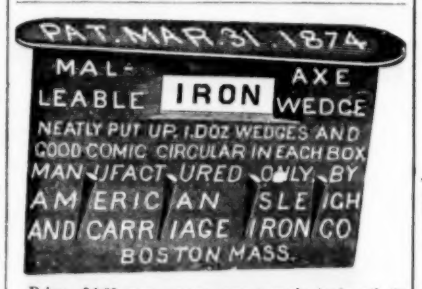
For Boring PUMP LOGS. All sizes in stock. **Socket Shanks. Ring Handles, and Connecting Rods** for the above to order. Also **Tenoning Tools** for jointing log ends. **Coopers' and Slaters' Tools.** Tool Chests. Tools for all trades a specialty.

JOSEPH THOMPSON,
Block & Pump Maker,
36 Burling Slip and 86 South St.,
Near Pier 20, East River, **NEW YORK.**

STEERING APPARATUS,
For Steamships, &c., made and fitted up.

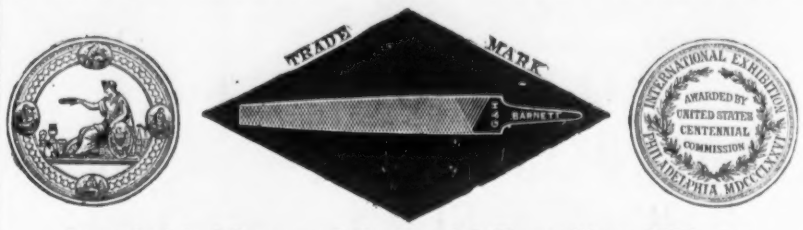
Iron Pumps Reamed & Re-Chambered.

Also, Patent Pressed Pump Leathers, Galvanize Iron Hanks, Oars, Mast Hoops, Hanks, Belaying Pins, Hand Spikes, Capstan-bars, Hand Pumps, &c., and every article appertaining to the trade, of the best material. General dealer in Lignumvitæ.



Price, $4·80 per gross; one sample by mail, 10 cents; one each size (three sizes) by mail, 20 cents, one dozen by mail, 60 cents. For sale by wholesale dealers in Boston, New York, Philadelphia, Chicago and St. Louis.

Black Diamond File Works.



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G. & H. BARNETT,
39, 41 & 43 Richmond St., Philadelphia.

ESTABLISHED IN 1816.

NO CONNECTION WITH ANY OTHER HOUSE.

PETER A. FRASSE & CO.,

No. 95 Fulton Street, New York.

AGENTS for the American Screw Co.'s Machine Screws and Taps.
SOLE AGENTS Thos. Turner & Co.'s, Files, Horse Rasps.
" " Hubert's French Emery Paper.
IMPORTERS OF STUBS' Files, Tools, Steel Wire.
" " GROBET'S Fine Swiss Finishing Files.
" " VAUTIER, NICOUD and RENARD Gravers.
" " JEWELERS' and Machinists' Supplies.
DEALERS IN Scroll Saw Machines, Bracket Saws, Wood and Patterns.

CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted **CAST STEEL.** **187 Tenth Street, Williamsburgh, New York.**
All descriptions of Files made to order. Price List mailed on application. **Established 1863.**

AUSABLE HORSE NAILS

POLISHED OR BLUED.

HAMMERED AND FINISHED

The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

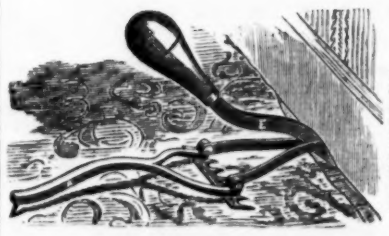
Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,
35 Chambers St., New York.

BULLARD'S PATENT CARPET STRETCHER.

Patented June 13th, 1876.



The Best Thing ever made for Laying Carpets.

It is light but durable, simple in construction, and powerful, as it has a short fulcrum and good length of lever, which makes it easy to operate, and is warranted not to injure the finest carpet. It holds the carpet in position after it is drawn to its proper place, thus giving the operator the free use of both hands with which to do the nailing. The lever, E, is then folded back and down upon the push bar, A, so it will be entirely out of the way while the carpet is being nailed. No person using one once will be without one. It needs only to be seen to be appreciated.

For UTILITY it defies competition.

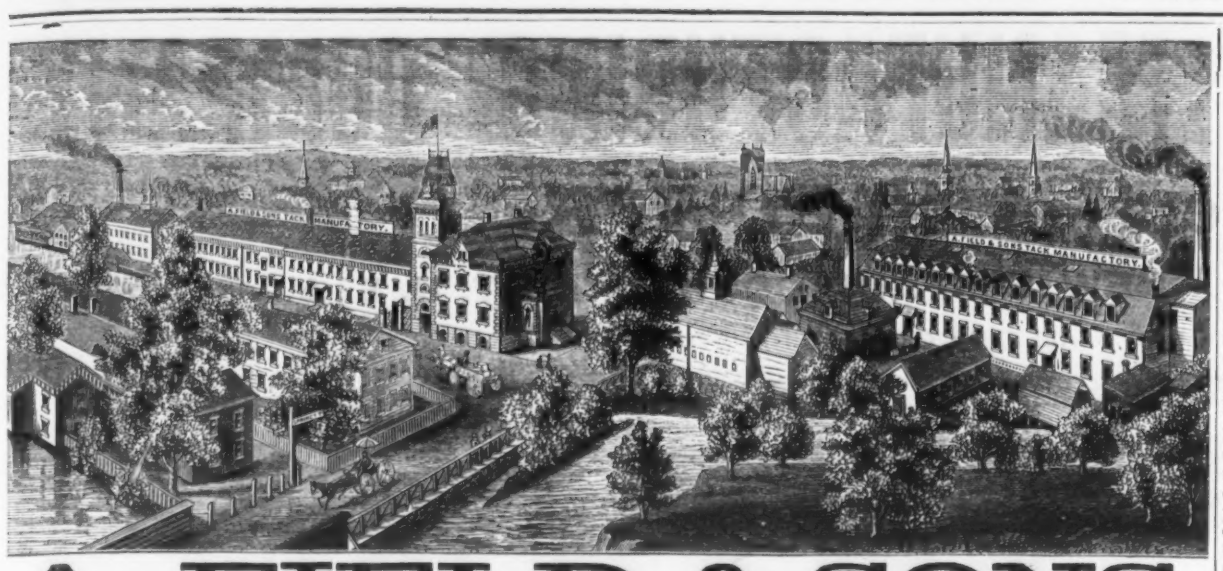
MANUFACTURED BY

The Cowles Hardware Company,
UNIONVILLE, CONN.

BAEDER, ADAMSON & CO.,
Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.
(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felting for Covering Boilers, Pipes, &c., Cow Hide Whips.

Stores: **PHILADELPHIA, 730 Market St., NEW YORK, 67 Beekman St., BOSTON, 143 Milk St., CHICAGO, 152 Lake St.**



A. FIELD & SONS,

TAUNTON, MASS., Manufacturers of

COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDES IRON TACKS. for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads. Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

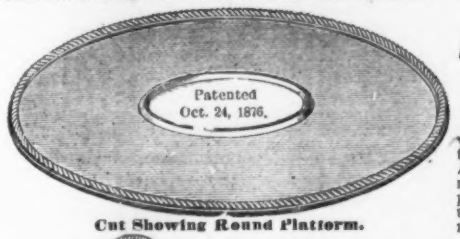
Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y.,

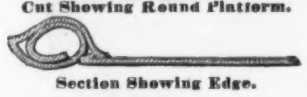
where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

☞ Any variations from the regular size or shape of the above named goods made from samples, to order. ☜

ANSONIA CORRUGATED STOVE PLATFORM



Cut Showing Round Platform.



Section Showing Edge.

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,

NEW YORK.

The Ansonia Corrugated Stove Platform, with its heavy figured ogee border, is believed to be the best Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 24 in a case.

Send for price list.

ANSONIA

Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or Shield, as shown in the illustration, is especially designed for the safety and protection of walls, furniture, woodwork, paper or varnish from heat.

Being constructed of metal, with firm and substantial edges, curved in form to stand alone, it may be easily adjusted to any position about a stove, before a grate or fire place. The demand for something useful, durable and ornamental as a Fire Screen has long been felt, and having finally accomplished the desired result, we are prepared to fill all orders promptly.

To the Hardware Trade.

A General assortment of

HARDWARE

For the country trade constantly on hand.

JOHN I. BROWER & SON, 288 Greenwich Street, New York.

JOWETT'S HORSE RASPS, 16 IN.

THE

"Antrim" Mincer

For Hashing, Chopping, etc.

A simple, clean, cheap and useful machine for every day use, that stands without rival for its intended purposes.

Retail Price, $1.

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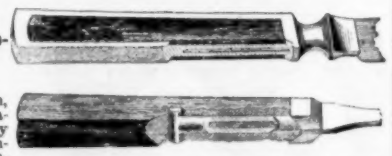
Patent Hot-Water-Proof CUTLERY.



For Durability & Actual Excellence Unexcelled.

Good Butcher and Shoe Knives a Specialty.

GOODELL CO.,

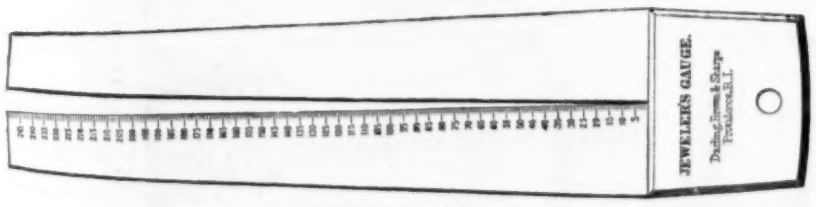
Antrim, N. H., and 95 Reade St., New York.

JEWELERS' WIRE GAUGES,

MADE BY

Darling, Brown & Sharpe,

Providence, R. I.



(This cut is one-half of actual size of gauge.)

PRICE - - - - - - - $6.50.

These Gauges are made with special reference to the wants of Manufacturing Jewelers. One edge of the angular slot is graduated into 250 parts and figured to give the size in thousandths of inches. For example, a size of wire which passed down half way in the slot, will stop opposite 125, is $\frac{125}{1000}$ of an inch in diameter. The angular slot has no sharp edge to injure the stock gauged.

Hoisting Machinery

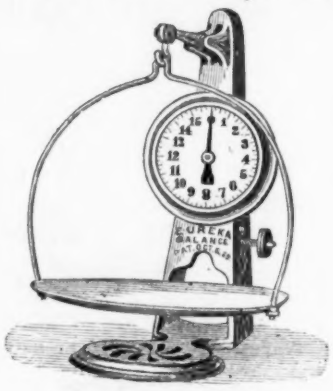
Manufactured by

Crane Bros. Mfg. Co.,

CHICAGO.

COOKE & BEGGS, Agents, 16 Cortlandt Street, New York.

Eureka Self-Adjusting



SCALES.

Have a patented *attachment for* ascertaining the *tare* of a *dish* or other *receptacle* used in weighing *without* the use of *weights* or *loss* of *time*. Manufactured only by

JOHN CHATILTON & SONS,

91 & 93 Cliff St., New York.

DROP FORGINGS

AND

Special Machinery.

Hardware & Tools and Specialties in Metals manufactured to order.

HULL & RELDEN CO., Danbury, Ct.

Oldest and Largest Establishment of the kind in the U. S.

F. L. & D. R. CARNELL,

844 Germantown Avenue, Philadelphia

Manufacturers of Pennsylvania Brick Machine, Little Giant Pipe Machine, Fire and Red Brick Presses, Clay Wheels, Tile Machines, Stampers, Grinding Pans. Brick Yards fitted out for running by steam or horse. Heavy and Light Castings. Send for circular.

PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris, 1867; Moscow, 1872; Vienna, 1873, and **only Award and Medal for Self-Coiling Steel Shutters at Centennial Exhibition, Philadelphia, 1876.**

CLARK & CO.,

ORIGINAL INVENTORS AND SOLE

PATENTEES OF

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best** and **Cheapest** in the world. Are fitted to new *Tribune* Building, Lenox Library, Delaware and Hudson Canal Co.'s Building, Transatlantic Steamship Co.'s new Dock, American News Office, &c., Posey County Court House, Mt. Vernon, Holt County Court, Oregon, Mo. Also to buildings in Boston, Cincinnati, Detroit, Janesville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are indorsed by the **Leading Architects of the World.**

Office and Manufactory,

162 & 164 West 27th Street, N. Y.

The Tribune on "Industrial Monopolies."

The following article appeared in the New York daily *Tribune* of Oct. 24:

It is one of the most lamentable weaknesses of weak human nature that men will rarely profit by the dearly-bought experience of others. So many monopolies have been tried, ending in ruin to everybody concerned in them, that a man of average sense might be expected to hesitate long before risking his means in another attempt to force the public to enrich him. Yet the very first suggestion, if hard times overtake any branch of trade, manufacture or labor, is still to combine, and thus to extort from the public the pay which is not voluntarily given. Strikers have wasted millions of money in trying to force employers to bear all the losses of hard times, and still there are other strikers to follow in their footsteps. Even the powerful coal combination has gone down, bringing ruin to some great companies and sore loss to thousands of investors, and yet the producers of Bessemer steel fancy that they can fleece the public as much and as long as they please.

The manufacture of Bessemer steel in this country has been pushed so rapidly that the capacity of existing works far exceeds the present demand. This is not strange. For a time, the profits were very large. When the price of pig iron or of iron rails rapidly declined, there was still a handsome profit in the making of Bessemer, and owners of mines were eager to get capitalists to put up works by which a larger market would be furnished for their ore. As always happens, when prices have been comparatively high and profits large in any business, more persons rushed into that business than could get satisfactory returns, though some of the latest to enter the field, by reason of superior facilities, may ultimately prove the strongest. Nature's remedy is to cause some establishments to close. Open competition tends to the survival of the fittest; those who can serve the public best hold the market, and others are forced to step aside. But the spirit of monopoly resists; binds the fittest and the least fit together in a league; makes war upon mankind, and tries to force the world to support a larger number of mills and workmen than are needed. The compact, of which details have been published, is virtually an attempt to extort from the public $10 per ton more than the rails now bring; the production of some companies is said to be restricted, while others bind themselves not to sell rails below a certain price, receiving a bonus from the companies which sell as much as they please. To the consumer the effect is the same as if some sturdy footpad had robbed him of $10 for every ton of iron purchased. This combination, also, will probably arouse bitter hostility. The average man does not like to have his money extorted from him by force.

Perhaps it does no good to warn these monopolists that they have trouble ahead. If they credited the warning, perhaps they would prefer to pocket the unearned profits to be extorted from the public, in full confidence that when danger approaches they can sell out to innocent and unsuspecting people, and leave them to face the ruin. But civilized society abhors a monopoly as nature abhors a vacuum. Sooner or later, punishment will come for violation of nature's laws. New works will be put up for the manufacture of Bessemer steel, or still cheaper methods discovered for making iron more durable in rails. By what method civilization will overwhelm these banded enemies of society no one can tell, but the one thing certain is that they will be overwhelmed. The sympathy to which a struggling industry was entitled, they will have forfeited.

The *Bulletin of the Iron and Steel Association*, on Nov. 7th, copies the article, and adds:

[The following reply to the above was written and mailed to the *Tribune* on October 27th, but up to the 31st it had not appeared in its columns. We also know of another communication on the same subject which has been sent to the *Tribune* but has not yet been printed.]

Office of the CAMBRIA IRON COMPANY,
JOHNSTOWN, PA., Oct. 27, 1877.

To the Editor of The New York Tribune.

—DEAR SIR: I have just had my attention called to your editorial entitled "Industrial Monopolies," published during my absence from home, which I think does great injustice to the manufacturers of steel rails. I was not present at the Philadelphia meeting, but I approve in the main of its objects and regret that they could not be accomplished.

It is as well known to consumers as to manufacturers that the price of steel rails is too low to keep the mills in operation and maintain the high quality of excellence desired in the product. The continued and now ruinous decline in price is a consequence of overproduction brought about in a most unexpected way. The steel works of the country are substantially alike, and the estimated capacity of each plant was from 15,000 to 20,000 tons annually. This was about what was done abroad, and our foreign visitors, during the Centennial year, were astonished to discover that, through improvements in machinery and the superior activity and skill of our workmen, we were producing as much as 50,000 tons. While this result is creditable to American enterprise, it has been destructive of pecuniary rewards. It has created a competition which intelligent railroad managers do not wish to see, but which they are obliged to avail themselves of to the fullest extent, though they do not desire to have any of the works forced into idleness or bankruptcy. The purpose of the Philadelphia meeting of manufacturers was to fix some plan to prevent this, and the strongest companies were favorable to it though they could see their way to a real monopoly, in the mode you suggest, by driving the weaker concerns out of existence. The ten steel works in operation are very well placed for the service of the consumers, and the railroad companies are interested in keeping them in operation, for a great deal of transportation is required by them and their dependent industries.

Opinions will differ about the propriety of trade combinations, and the *Tribune* is entitled to its own judgment upon the subject, which it might express in a more kindly way. The producers of Bessemer steel do not "fancy that they can fleece the public as much and as long as they please." Bessemer steel rails were first made in this country on orders in 1867–8, and the yearly average of price per ton in 1868 was $158.50. In 1873, the year of the panic, the average price was $120.59; the average price of iron rails during that year was $76.66⅔. Steel rails are now quoted at $44 to $45 per ton, and are sold for less. The enterprising men who have brought about this astonishing result, enabling railroad companies to meet their charges for renewals and repairs at such enormously reduced cost, while greatly increasing the safety of travel, hardly deserve the epithets which you so liberally bestow upon them. No consumer or intelligent railroad manager accuses them of "fleecing the public."

It was distinctly announced, on the part of the mills which the Philadelphia plan proposed to leave unrestricted in price and amount of product, that prices would not be put up materially or immediately. Your report is, in the main, accurate, but upon this point your information has been derived from some one having very little weight, and who, I doubt not, would be recognized as a "blatherskite" by his associates.

If an arrangement could have been effected which would have kept the works alive, yet prevented overproduction and brought the price of rails within a year to $50, the manufacturers would not have pocketed the advance, nor is it true that the effect to the consumer would have been the same as if some sturdy footpad had robbed him of $10 for every ton of iron purchased.

As soon as it appeared that this advance could be maintained, it would have spread itself out over the suffering labor employed in steel works and their dependent industries. Producers of pig metal, and indeed the whole iron trade, would have been benefited, and it might have resulted in that turning of the tide and beginning of better times which everybody is hoping for. Perhaps this is stated too strongly; the wreckers do not hope for the better times in which they will find their occupation gone: they look with complacency upon bankrupt industries, and it is popularly believed that they readily secure for their destructive schemes newspaper influence and support.

I might discuss this matter further, but when I see that, among other wild epithets applied to the steel makers, you denounce them as "banded enemies of society," I fear that you are not in the frame of mind to listen to reason on the subject. Possibly I am indiscreet in venturing to dissent from your views on a subject which I should be credited with knowing something about, but I hope and believe you will cool down somewhat before you open upon me personally. As I do not own a newspaper, you have me at a decided disadvantage.

Briefly, there is no combination; so your indignation is wasted. There was no intention to add $10 to the price of rails, nor would it be possible to do so. The prices proposed as a minimum for Western mills are but from $1.50 to $2 above what they receive at the present time. No consumer would be injured by putting steel rails up to $50 per ton, if, as I have stated and believe, the advance would revive all allied and dependent industries. The continued effort to make and sell steel rails at a less price must result in the bankruptcy of a number of establishments, with consequent injury to employers and workingmen and the communities in which the works are placed. The transporting interest would suffer as much by this as anybody else, unless they are like the tavern-keeper who thought if all the world was dead he could do a thriving business. Yours, truly, D. J. MORRELL.

Labor Saving Machinery in Massachusetts.—A feature of the Massachusetts census of manufactures for 1875, deserving especial notice, is the showing made in regard to the effect of labor-saving machinery on the production of some of the leading staples. We find that, with 24,151 hands employed in 1865, there was produced 175,875,000 yards of goods, a ratio of 7,355 yards to each employe. In 1875 there was produced 874,780,000 yards by 60,176 employes, or about 11,213 yards to each hand. This shows that with an increase of a little over 149 per cent. during the ten years, in the number of hands employed, the quantity of cloth produced was increased nearly 392 per cent. Woolen goods also make a very striking exhibit. For 1865 the production is placed at 46,008,141 yards, and the number of employes 18,753. For 1875 the production is 90,208,280 yards, and 19,036 employes, showing an increase of 96½ per cent. in production to 1½ per cent. in the number of employes. The number of pairs of boots and shoes made in 1865 was 31,870,581, and number of employes 52,821; and in 1875, 59,762,866 pairs with 48,090 employes. This is probably the most important showing made, the production during the ten years having been increased nearly 88 per cent., while the force employed was less by 4,731. The product of carpetings in 1875 increased fourfold as compared with 1865, while the increase of force employed was less than half that amount. The average value of the boots and shoes produced in 1845 was 70 cents a pair; in 1855, 80 cents; in 1865, $1.80, and in 1875 $1.50. The value of carpetings was $2 per yard in 1865, and less than 73 cents per yard in 1875—which shows the source of the immense supply of dollar carpetings. The great reduction in the number of employes in the clothing business shows to what an extent the sewing machine, the machine shear and more careful gradations of "ready-made" have superseded the need of the tailor and the needle-woman.

The Teviotdale, an iron ship bound from Cardiff to India with a cargo of coals, was abandoned on fire on the 1st of November, 1876, near the Mauritius, the crew having been picked up soon after leaving the vessel. On the night of 17th of September, 1877, the mail steamer Hindostan, on her way from China to Suez, came across the abandoned Teviotdale two days before reaching Aden, and found the coal still smoldering in her hold. The fire had thus lasted ten months, and she had drifted about 2000 miles in that time.

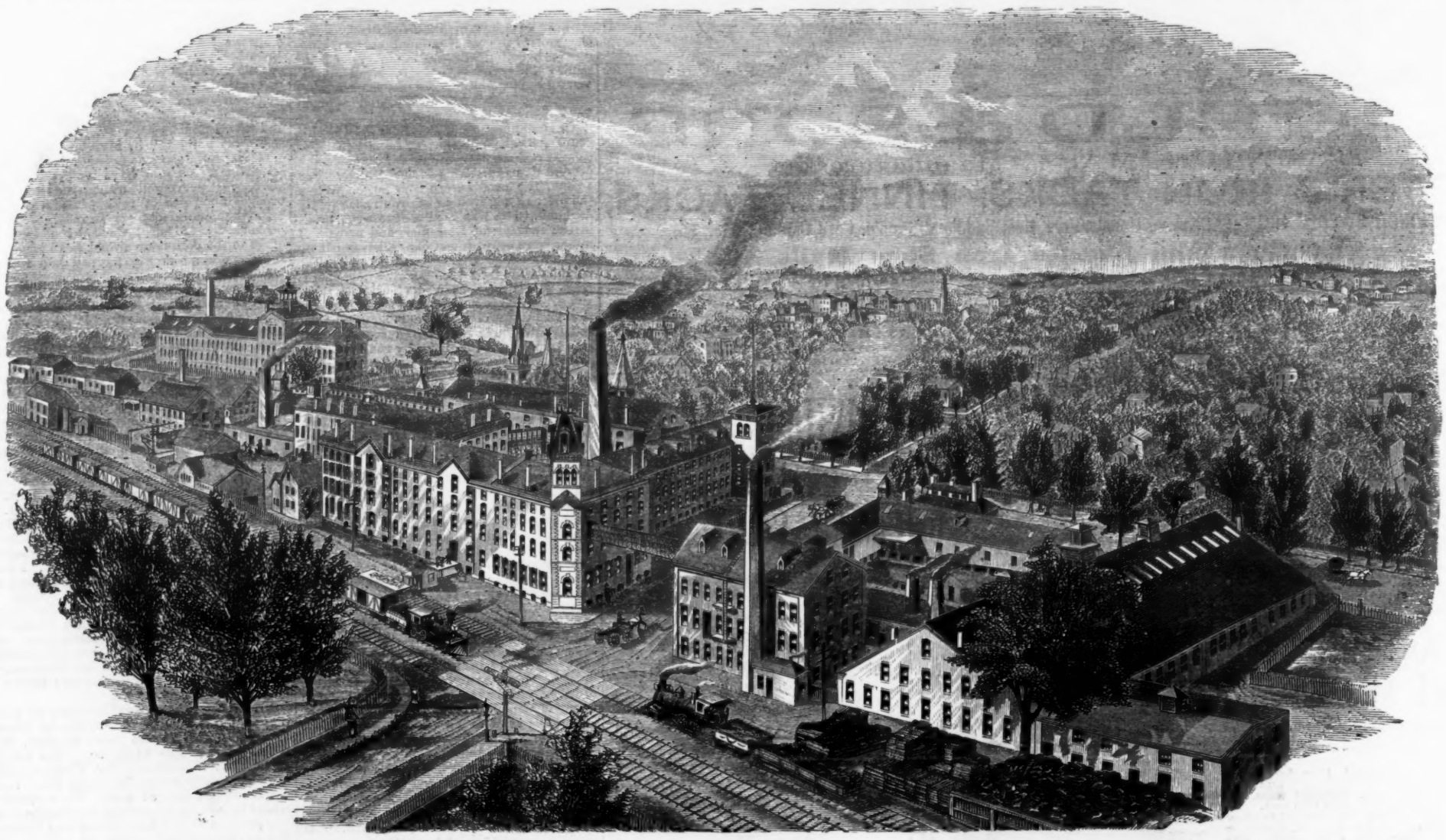
RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE. Agent, 17 South Charles Street.



Screw Factory. *Offices, Packing Room and Main Factory.* *Finishing Shop.* *Iron Foundry.*

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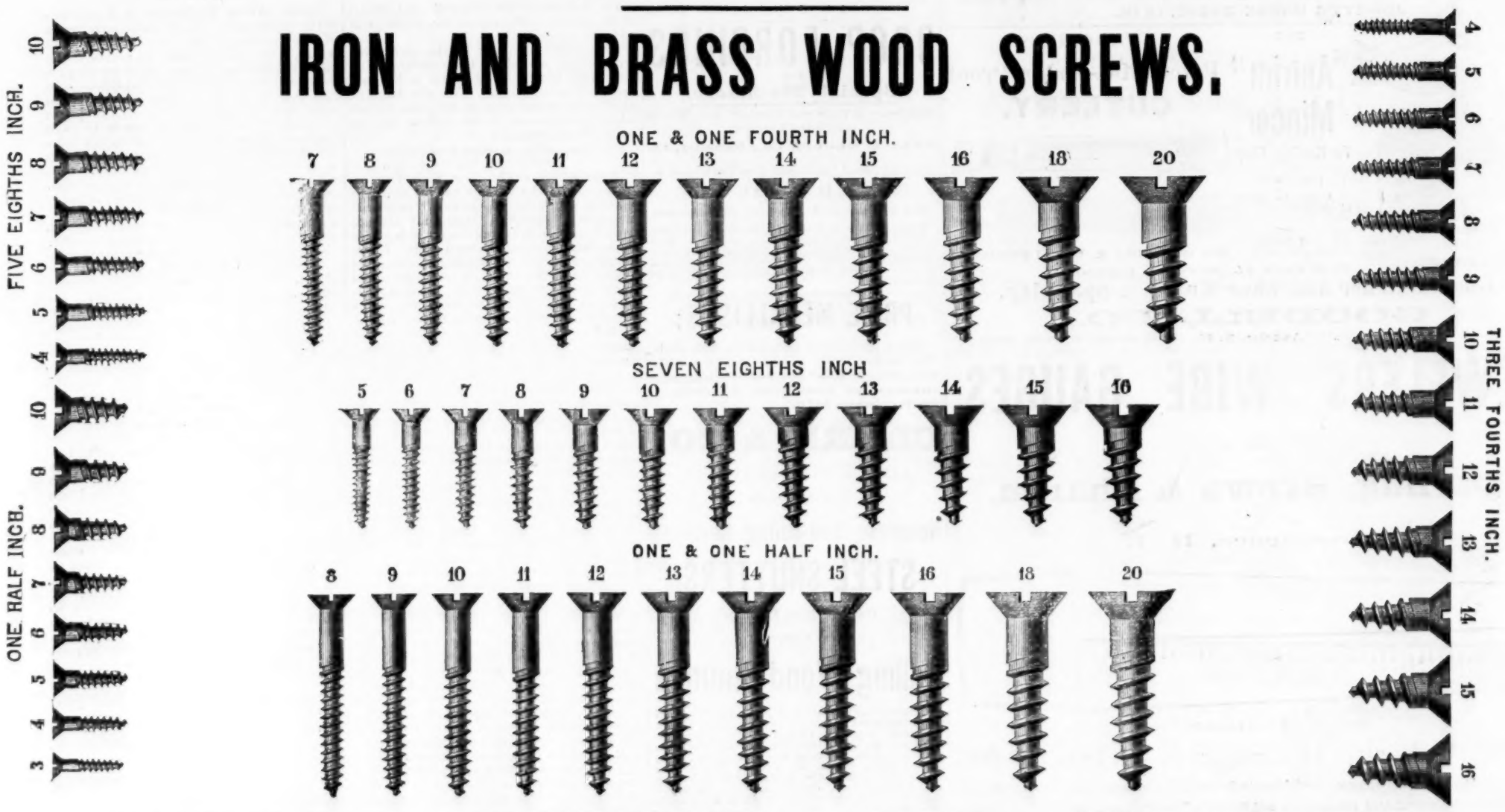
THE RUSSELL & ERWIN MANUFACTURING COMPANY,

NEW BRITAIN, CONNECTICUT, U. S. A.

IRON AND BRASS WOOD SCREWS.



ASSORTMENT COMPLETE. Orders Filled Promptly.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - - NEW BRITAIN, CONNECTICUT, U. S. A.

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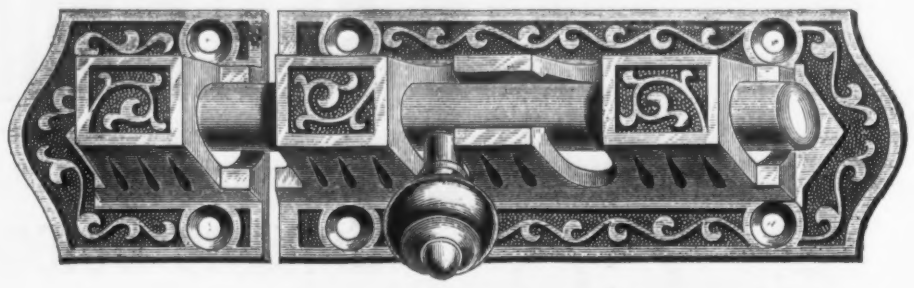
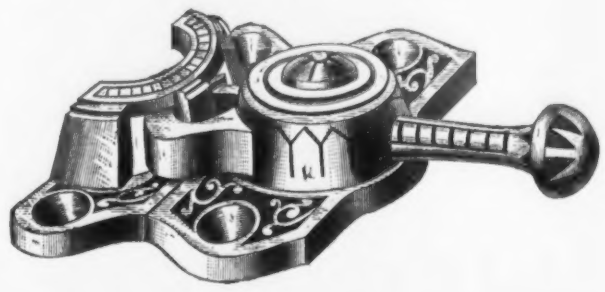
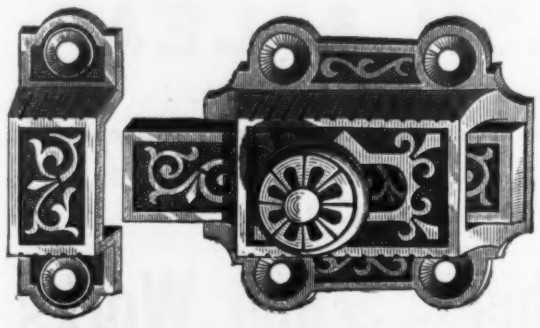
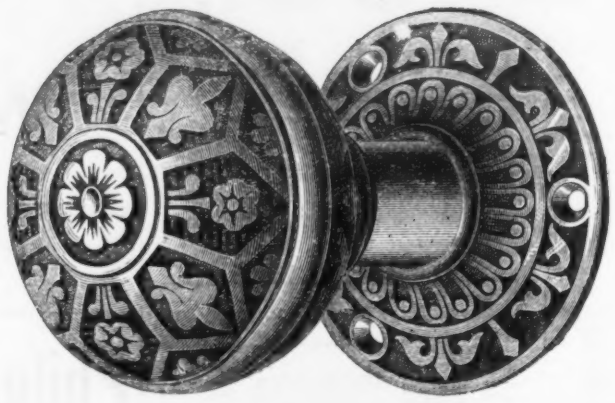
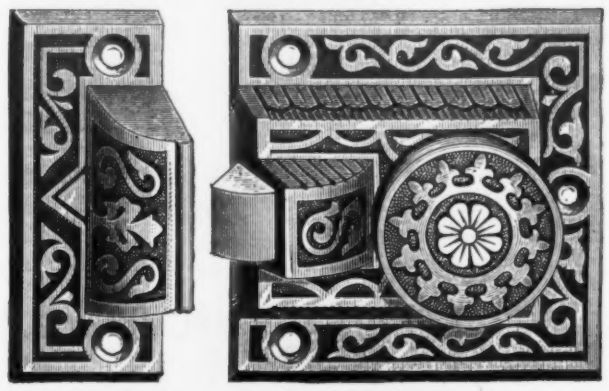
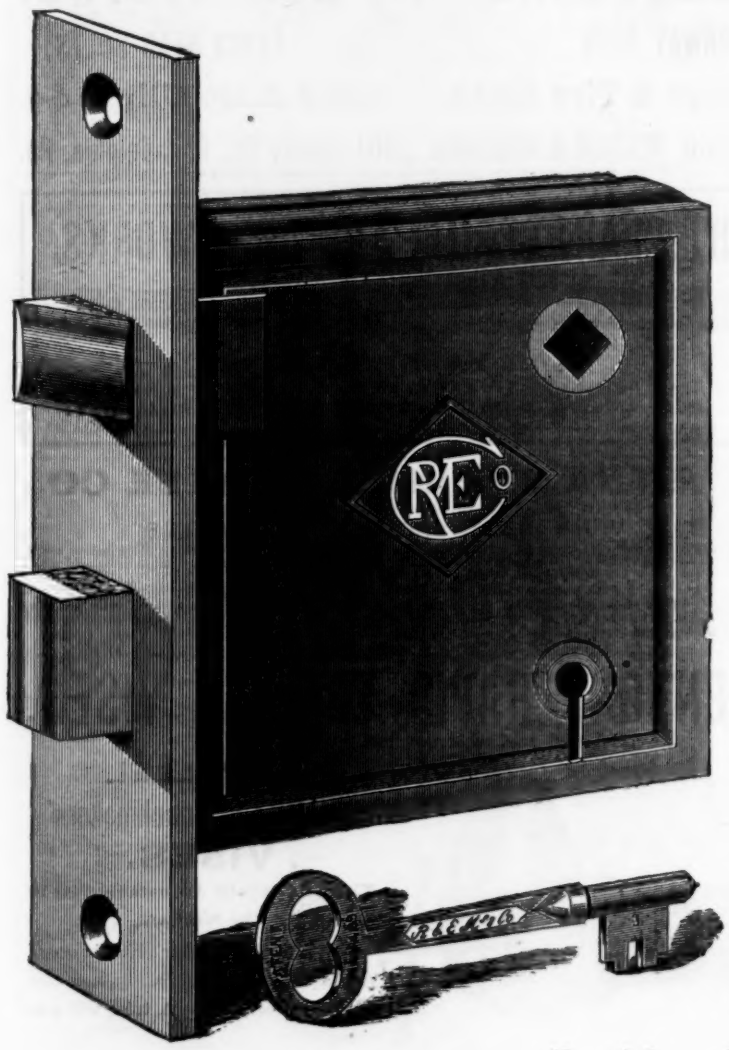

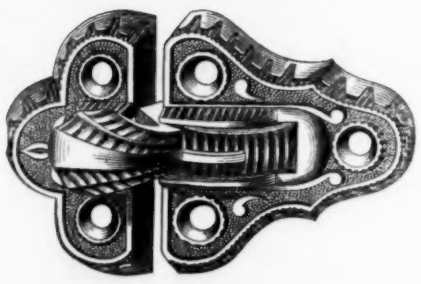
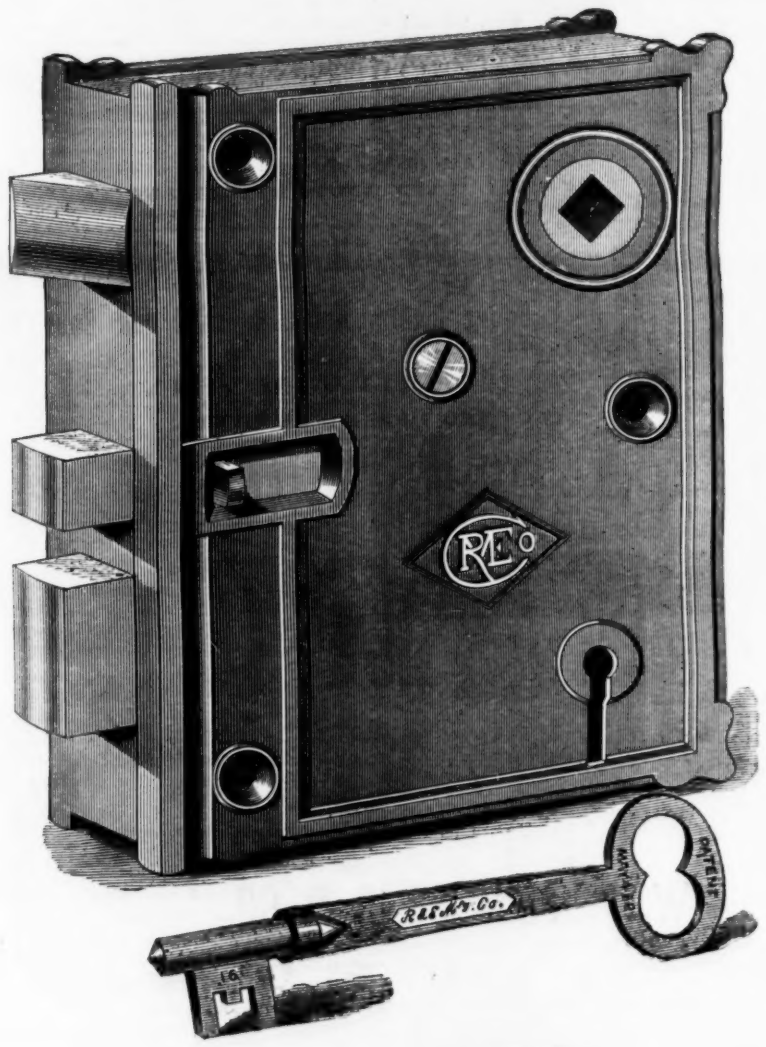

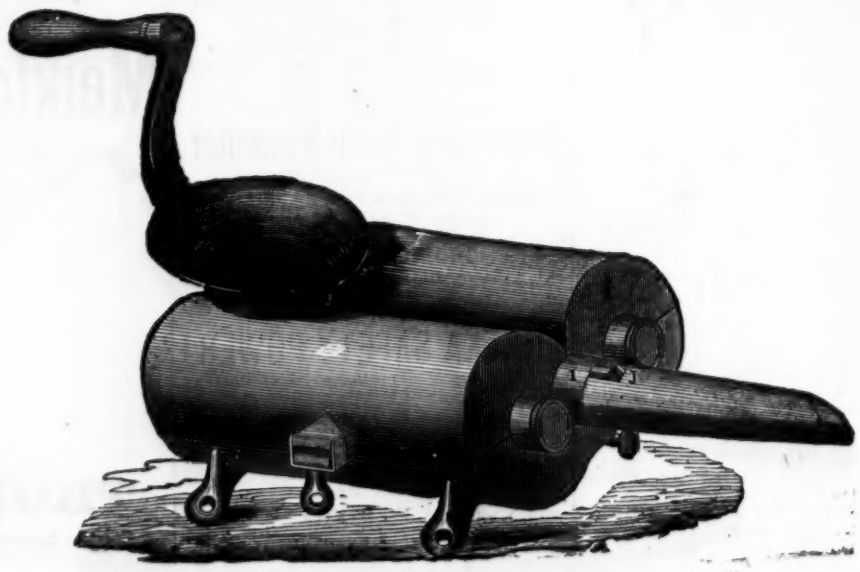
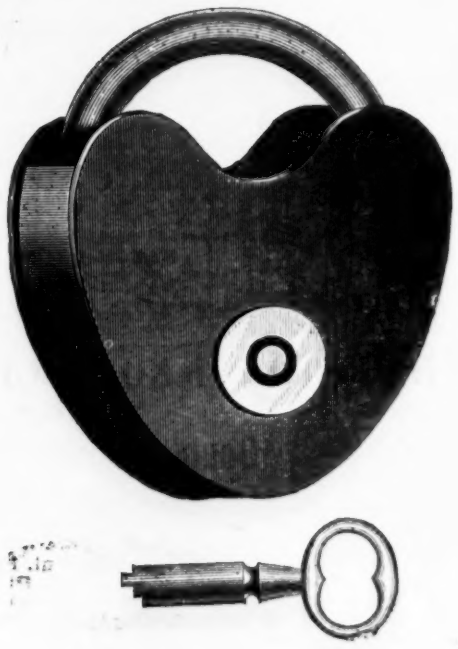

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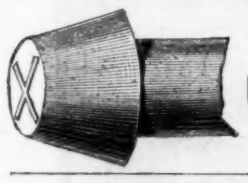

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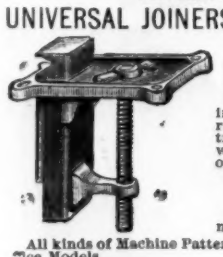

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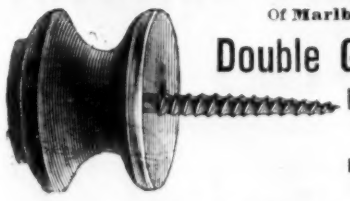

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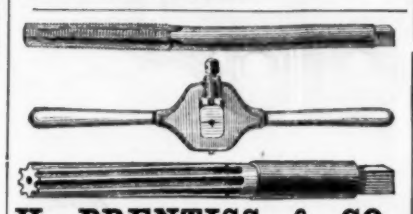

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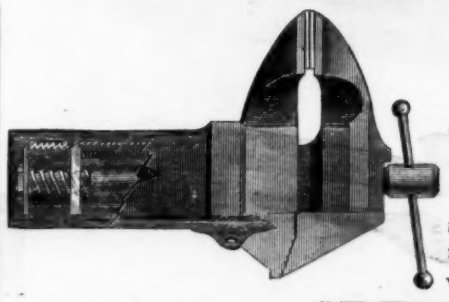

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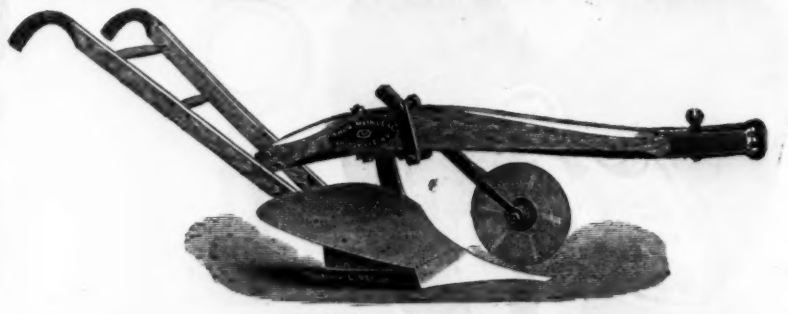

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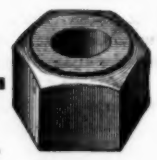

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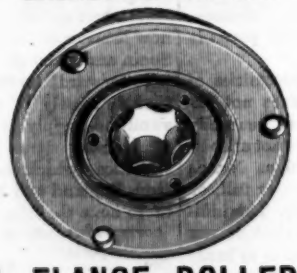

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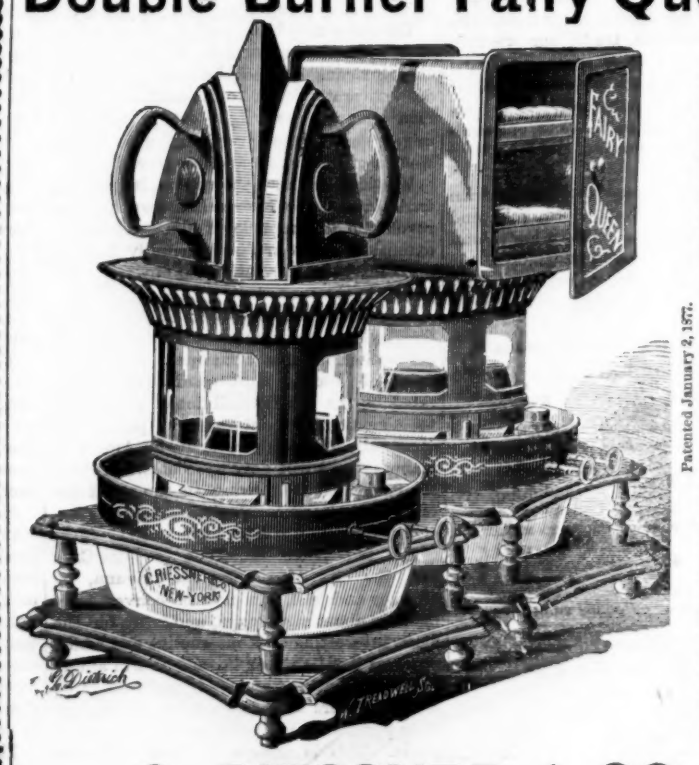

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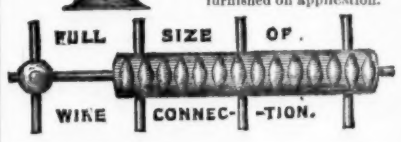

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Thirty-ninth Page.—Boston and St. Louis Hardware and Metal Prices.

We publish upon the first page this week a very important article on the Paris Exposition, in which the Hon. Abram S. Hewitt's views are given at length. We are glad to see that Mr. Hewitt has so soon taken measures to bring the matter before Congress. The appropriation should be given at once; the time remaining in which to organize a commission is short and the space available small, hence the utmost expedition is necessary. The amount of the appropriation should be liberal, since a great deal of work must be done in a short time. The country cannot afford to be unrepresented, and we hope that every possible means will be taken to secure the necessary appropriation. It appears to us that the $140,000 asked for in the bill which Mr. Hewitt introduced into the House, is much too small—$240,000 would be much nearer the sum really required.

Our Trade with Mexico.

Of the various Spanish-American republics, Mexico is to us one of the most important, not only from a geographical and political point of view, but commercially also. When Mexico prospers and enjoys profound peace, commercial intercourse with our Southern neighbor immediately expands, and English and American capital is quite ready to assist in endowing the republic with a more complete network of railroads, especially those intended to link together the two countries. Unfortunately, the years of peace in Mexico are the exception and political squabbles the rule: but for this we should, in all probability, do five times our present business with that country. But, in spite of continual political upheavals, the foreign trade of Mexico has at all times been of considerable importance, owing to the enormous productive and consumptive capacity of the country, the hardy and sober laboring population of its uplands, and its unsurpassed geographical position midway between the great oceans. That part of the population constituting the laboring classes of Mexico is, for the most part, either of pure-blooded Indian or of mixed descent; some native Spaniards from the Canary Islands and Gallicia also perform the coarser kind of manual labor, and among the miners we find many Mexicans of pure Spanish origin. The bulk of the laboring classes is devoted to agricultural pursuits.

The silver mines were developed and attained great importance under the Spanish mining laws, which in their way were perfect models and still underlie the mining system of the republic. Although the mines were extensive and productive as long as Mexico remained under Spanish sway, they probably at no time occupied more than 50,000 miners. Mexico now produces $20,000,000 silver annually.

Manufacturing was carried on to a moderate extent among the Mexicans when Cortez landed 350 years ago. They made coarse cotton fabrics, paints, pottery, gold and silver ware and all sorts of leather goods. In the making of these articles the Mexicans still display great skill, especially in leather work, prominent among which are their famous embroidered and silver-ornamented saddlery goods. In dyeing they have at all times been great adepts; but their once famous cochineal is now excelled in quality by that of neighboring States and the Canary Islands. Their vanilla beans are still unrivalled by any from Mauritius, Madagascar or Java.

Whatever the tropical and temperate zones are capable of producing, the Mexican soil yields, and, with few exceptions, of excellent quality. The mineralogical resources are as rich as they are varied, and we believe tin is about the only metal not produced within its borders. Our imports from Mexico consist of coffee, hides, goat and deer skins, logwood, fustic, lima wood, mahogany, cedar, Sisal grass, Tampico hemp, cochineal, vanilla, sarsaparilla, some sugar, argentiferous lead and onyx. Mexico in return takes from us pretty much everything we manufacture except furs, woolen goods and skates.

What precedes suffices to show that Mexico, when not disturbed by civil war, is a most desirable country to deal with; besides, the future of Mexico from its proximity is, so to speak, bound up with ours. At a not very distant day the Texan railroad system will connect with a branch line from the city of Mexico to the American frontier, and we shall then not unlikely transact as large a trade with our neighbor as any of our States are now doing with each other. The only railroad now in operation in Mexico is the one which connects the capital with its seaport, Vera Cruz, built by English capital. While we quietly await the advent of the mutually prosperous era we have alluded to, we can contribute much toward preparing and facilitating it by bestowing redoubled attention upon our existing relations with Mexico, and fostering them as much as we safely can considering the still unsettled state of that country. If the Europeans at such a distance manage to carry on a large and lucrative Mexican trade, our vicinity ought to enable us to do as much and even more; but we regret to say this is not yet the case. In spite of our excellent steamship line to Vera Cruz *via* Havana, our dealings with Mexico are not as large as they might and should be.

The total import of goods into Mexico from abroad in 1874 was $28,450,000, gold, and the export, $25,400,000, constituting a total trade in merchandise of $53,850,000. It will be of no small interest to compare England's Mexican trade from 1870 to 1874 with our own:

ENGLAND'S EXPORT OF GOODS TO MEXICO.
Gold Values.

1870.	1871.	1872.
$6,090,130	$4,497,690	$5,290,640
1873.	**1874.**	**Total.**
$6,899,365	$6,614,380	$29,392,205

ENGLAND'S IMPORT OF GOODS FROM MEXICO.

1870.	1871.	1872.
$1,499,065	$1,986,670	$2,217,620
1873.	**1874.**	**Total.**
$2,497,660	$2,733,255	$10,934,270

UNITED STATES' EXPORT OF GOODS TO MEXICO.

1870.	1871.	1872.
$5,875,000	$7,651,000	$5,579,000
1873.	**1874.**	**Total.**
$6,430,000	$6,005,000	$31,540,000

UNITED STATES' IMPORT OF GOODS FROM MEXICO.

1870.	1871.	1872.
$13,099,000	$17,511,000	$8,507,000
1873.	**1874.**	**Total.**
$16,430,000	$13,239,000	$68,786,000

RECAPITULTION—1870–74.

	England's Trade.	U. S. Trade.
Export to Mexico	$29,392,205	$31,540,000
Import from Mexico.	10,934,270	68,786,000
Total trade	$40,326,475	$100,326,000

It will be seen, therefore, that while our export to Mexico during these five years but slightly exceeded that of England, we imported thence more than six times as much as our European rival. To a country whose products we take in such considerable quantities, we ought to be able to sell our own goods in much larger amounts.

In 1874, as we have shown, Mexico imported altogether from foreign countries $28,450,000, toward which England and the United States furnished together $12,619,380, or about 44 per cent., and in the same year the Republic exported $25,400,000, out of which England and the United States received together $15,972,255, or 63 per cent., showing that Mexico's most active business intercourse is with the two Anglo-Saxon nations.

GENERAL TRADE MOVEMENT BETWEEN THE UNITED STATES AND MEXICO.
Fiscal Years.—In Thousands of Dollars.

	1864.	1865.	1866.	1867.	1868.	1869.	1870.
Imports from Mexico	7,884	8,656	4,844	3,921	6,116	7,833	13,099
Exports to Mexico—domestic goods	10,928	16,111	3,717	4,862	5,061	3,837	4,595
For'n goods	1,754	3,344	872	590	1,393	1,047	1,319
Total	20,566	28,111	9,433	9,373	12,570	12,716	18,974
	1871.	1872.	1873.	1874.	1875.	1876.	Total.
Imports from Mexico	17,511	8,507	16,430	13,239	11,635	12,506	131,580
Exports to Mexico—domestic goods	5,083	3,446	4,085	4,074	3,896	4,707	74,363
For'n goods	3,568	2,133	2,345	1,931	1,875	1,501	22,672
Total	25,162	14,086	22,860	19,244	17,406	18,714	228,615

The foregoing table shows that the amount of trade has fluctuated a great deal from one year to another, according to the political status of Mexico. During the French occupation we sent an enormous amount of goods, principally flour and provisions, for the French army. During the ensuing few years of Mexican impoverishment in consequence of the war, we shipped very little; since that time our export has gradually become steady. Our export of domestic goods to Mexico during the fiscal year ended June 30, 1876, was made up principally as follows:

Agricultural implements	$18,243
Mules and other live animals	177,449
Biscuit	10,992
Flour, &c	198,002
Clocks	9,441
Coal	13,785
Cotton	890,574
Cotton goods	373,459
Drugs	109,228
Cordage	8,960
Hardware, &c	957,850
Leather goods	89,831
Petroleum	171,348
Provisions	79,311
Sewing machines	75,577
Refined sugar	36,561
Tobacco	106,715
Lumber	126,303
Woodenware	97,955
Total	$3,551,584

The large share which hardware, &c., had in this movement should be noticed. Although, as we have mentioned above, the Mexicans manufacture many articles cheaply and to perfection, hardware is not one of them; and since their occupations are so manifold, embracing, besides manufacturing, agriculture, forestry, stock farming and mining, there is hardly an article of hardware or tools of any sort which they do not use. The English, Belgians, French and Germans furnish them European hardware and arms, tools and machinery in endless variety. The hardware importers, dealers and retailers in Mexico are mostly Germans, and these firms are to be met with by the dozen in every Mexican city of any importance. But these German houses by no means confine their importations to European goods; on the contrary, for the past 30 years they have been in the habit of ordering American hardware with which the Mexicans were familiarized during our occupation, and large amounts of our goods are thus yearly consumed there. This is a trade capable of almost indefinite extension if we will but push this business with greater assiduity.

The same may be said of American cotton fabrics, including prints. In this branch the Mexicans confine their manufacturing activity pretty much to the making of common blue or gray light cotton and wool mixed shawls, the "rebozos," worn by the women of the middle and humbler classes.

We think we have shown that, large as our trade with Mexico is, even in times of war and revolution, it is capable of almost indefinite extension if we are but earnestly bent on fostering existing relations so far as we can safely do so.

As was to be expected, California and Oregon have, from the very commencement, cultivated business relations with the west coast of Mexico most assiduously, facilitated by the Pacific Mail line of steamships to Acapulco and intermediate ports, and eventually an enormous trade in American manufactures will develop southward along the Pacific coast. Owing to the great distance from European ports, scarcely any foreign competition will be encountered.

The trip from New York to Vera Cruz and the city of Mexico *via* Havana, by steamer and rail, can now be conveniently made in about eight days, and is by far the most interesting and instructive one which presents itself so near home. It will amply repay the time and trouble if undertaken by manufacturers who desire to form connections personally and open a market for their goods. This is always the best and most practical method of pushing a business of such great promise.

Standard Wire Gauge.

The report of the committee of the American Institute of Mining Engineers, on the subject of wire gauges, published in our issue of Nov. 1st, should receive the careful consideration of all manufacturers and consumers of metals sold by gauge. The need of some standard gauge, or of some method of designating the thickness of sheets or wire that should avoid the well known difficulties of the present system of numbered gauges, has become more urgent with each year. The only reason, if it may be dignified with such a name, that can be urged in favor of the present system, is that it is old and gathers to it the glamor aad sanctity that attaches to most old things, as well as having all the faults of age. Besides this merit of age, the system has not one redeeming feature.

In the first place the gauges, with possibly one exception, are not constructed on any definite plan or system. The irregularity in the increase of thickness is provokingly puzzling. Take the Birmingham wire gauge, for example:

No. 24 sheet iron weighs .95 lbs. per square foot.

No. 23 sheet iron weighs .99 lbs. per square foot; increase over No. 24, .04 lbs.

No. 22 sheet iron weighs 1.15 lbs. per square foot; increase over No. 23, .16 lbs.

No. 21 sheet iron weighs 1.32 lbs. per square foot; increase over No. 22, .17 lbs.

No. 20 sheet iron weighs 1.41 lbs. per square foot; increase over No. 21, .09 lbs.

No. 19 sheet iron weighs 1.7 lbs. per square foot; increase over No. 20, .29 lbs.

It would puzzle a Kepler to find any law of increase here.

Aside from this irregularity in the increase of size in a single gauge, the same number will vary greatly in a dozen or more made by the same makers. Speaking of this fact the report says:

Your committee find that the gauges which are characterized by round holes or slots, designated by numbers, are only approximately correct. They not only differ in those of different manufacturers, but in a dozen made by the same manufacturer there often were very perceptible and annoying differences. They find that in the gauges with open slots the sides are rarely parallel, and that there are even greater variations in them than in the gauges made with closed round holes without plugs. They find that the numbers affixed to these holes vary so much, on account of the differences in the diameters of the holes, as to be a constant source of inaccuracy, uncertainty and annoyance. This variation has in certain cases been found to amount to as much as 50 per cent. of the weight of different wires of the same number which have been examined. It is therefore impossible to make even an approximate comparison of sizes, unless, besides the number, not only the kind of gauge, but also the name of the maker is specified, and even then this approximation cannot be relied upon when the gauges have been worn from constant use or bad tempering.

Another objection to the old system is, that the same number in different gauges vary greatly, so that No. 24 sheet iron or No. 8 iron means absolutely nothing, unless to the number is added the name of the gauge, as Birmingham, London, Stubs, &c. To show how these vary we append the following:

TABLE SHOWING THE DIFFERENCES BETWEEN WIRE GAUGES.

No.	London.	Stubs.	Brown & Sharpe.
14	.083	.083	.06408
15	.072	.072	.05706
16	.065	.065	.05082
17	.058	.058	.04525
18	.049	.049	.04030
19	.040	.042	.03589
20	.035	.035	.03196
21	.0315	.032	.02846
22	.0295	.028	.025347
23	.027	.025	.022571
24	.025	.022	.0201
25	.023	.020	.0179
26	.0205	.018	.01594
27	.01875	.016	.014195
28	.0165	.014	.012641
29	.0155	.013	.011257
30	.01375	.012	.010025
31	.01225	.010	.018928
32	.01125	.009	.00795
33	.01025	.008	.00708
34	.0095	.007	.0063
35	.009	.005	.00561
36	.0075	.004	.005
37	.0065	....	.00445
38	.00575	....	.003965
39	.005	....	.003531
40	.0045	....	.003144

The Brown & Sharpe gauge is the only one constructed on a definite system, the thickness of each number increasing in geometrical progression.

In view of the facts gathered by this committee, they make the following recommendations, having first stated that the conclusions were arrived at, for the most part, independently by the different members of the committee, and that they unanimously agreed in them:

1. The abandonment of the system of fixed gauges for commercial use.

2. The abandonment of the system of representing the diameters and sizes by numbers.

3. The adoption of the system of expressing sizes in thousandths of an inch or fractions of a millimeter.

4. The adoption of the micrometer as the method of measuring sizes.

There are some arguments in favor of the adoption of the system recommended by the committee, to which they neither refer at all or only hint at, which may be called the commercial reasons, and which, perhaps, would have been somewhat out of place in such a report.

It is well known that the necessities of manufacturing are demanding sizes not expressed in gauges, and which are generally fractions of numbers. Thus it is not uncommon to have sheet steel ordered as No. 24 light, or tight, or heavy, or scant, or full, or easy, or even No. 23½ or No. 24½. This indicates a necessity for numbers that do not exist. The best way to meet this is to insist that the thickness shall be given in fractions of an inch, and then there will be no trouble.

The committee refer to the trouble that arises from the difference in gauges of the same make—No. 24 at the mill with a new gauge, may be No. 25 at the consumer's with an old guage.

In regard to the gauge recommended, the committee say:

In the micrometer gauges the wearing surfaces are so arranged that they can be adjusted with ease in a few moments. The wear between the male and female parts of the micrometer can be adjusted by a binding screw. This adjustment can be repeated as often as required, so that the instrument will read with great accuracy until it is worn out. Your committee assured themselves by actual trial that with such gauges boys can be easily taught to read with great accuracy the thousandth of an inch or the fortieth of a millimeter, and that it is practicable to read even the eightieth of a millimeter.

The micrometer gauge is the simplest. It consists of a micrometer screw, with a vernier attachment, is susceptible of easy adjustment, is not likely to wear, is not complicated, is less likely to get out of order than the other gauges, is more easily read and requires less skill to read it than the sliding gauge with a vernier.

The importance of this subject should lead to its careful consideration, and we believe the adoption of the recommendation of the committee will avoid all the trouble that has heretofore been experienced in the use of gauges.

The Position of Copper.

Since we endeavored to explain the position of copper in August, it has not improved. Our market, it is true, has been somewhat relieved by large European purchases, but the demand for consumption during this fall has not come up to expectations. The supply seems to be more than ample for the present moderate requirements. The statistical position on this side at the commencement of last month, may be summed up as follows: Our shipments to Europe during the nine months amounted to 8,000,000 pounds Lake Superior; 5,000,000 pounds more were to follow, and for cartridges in this country it was estimated something like 7,000,000 pounds additional would be wanted, making of Lake copper alone 20,000,000 pounds thus disposed of. We estimate this year's Lake production at 36,000,000 pounds, and deducting therefrom the above 20,000,000 pounds, there would be left for home consumption during the twelve months a balance of 16,000,000 pounds. Although the demand from consumers has been less active during these fall months compared with what it was in summer, it is, nevertheless, believed that the 16,000,000 pounds will be absorbed, and that at the end of the year the stock will not be much larger than it was at its commencement.

In a short time lake navigation will close, and unless prices greatly improve, there will be but little inducement for the mines, especially those barely covering cost, to ship any copper this way by rail. Statistically, the position is, therefore, by no means a bad one on this side; but it is far from being a promising one, even at present low prices, unless consumption revives more vigorously. That speculators should enter the market and seek to control it we can hardly expect, as long as the future of copper in Europe remains shrouded in doubt, as it is at present.

The course of prices thus far this year has been strikingly downward.

PRICE OF LAKE SUPERIOR COPPER AT NEW YORK, 1877.

January	19⅜c.	August 16	18⅜c.
February	20c.	" 23	18⅛c.
March	19⅜c.	" 30	17⅞c.
April	19⅛c.	September 6	17⅞c.
May	19⅛c.	" 13	17½c.
June	19⅛c.	" 20	18½c.
July	19⅛c.	" 27	18½c.
August 2	19c.	October 4	18⅛c.
August 9	18⅝c.	" 11	18c.

It has been steady since, and is now worth 17⅞c. To some extent copper has, of course, been carried down by the declining gold premium, but principally by the great depreciation of copper in Europe.

The visible supply in England and France in October stood as follows:

	Tons.	Price of Chili bars.
October 1, 1877	35,523	£65. 10/
" 1, 1876	31,679	73.
" 1, 1875	30,456	82.
" 1, 1874	31,059	81.
" 1, 1873	35,405	82.
" 1, 1872	41,400	84.

Although the visible supply on the 1st Oct. was about the same as at the time of the panic four years ago, the price of bars had fallen 20 per cent. Copper stood at New York in October, 1873, 24½c., and is now 26 per cent. lower; but the greater decline here is due to the difference in the gold premium.

The general industrial and commercial condition of Europe and America being no worse than at the time of the panic in September and October, 1873, the question suggests itself why copper has declined 20 per cent. since, the statistical position being the same. The answer to this is simply that we have here to deal with the same cause which has brought down tin in Europe and lead in America, that is, excessive production. Although the statistics of the moment may look tolerably reassuring, there is the fact of production largely outrunning consumption in either or both hemispheres.

As regards copper, the rapidly increasing importation of ore into England and France, independently of the ingot import, has at length had an effect on the markets. It is now leaking out that the Rio Tinto mines in Spain and those of Newfoundland are sending forward large amounts of ore, and though mostly of a low grade, these ores swell the supply in a remarkable manner. They do not figure adequately in the trade statistics which are given every month from England and France, but the copper is there none the less.

COPPER MOVEMENT IN ENGLAND—FIRST 8 MONTHS.

Imports.	1877.	1876.	1875.
Ore.....Tons.	71,596	47,166	34,455
Regulus	24,741	22,008	23,129
Copper	28,944	25,438	28,353
Exports			
Foreign raw	9,700	11,188	10,006
English raw	6,924	7,808	6,924
Manufactured, including yellow metal and brass.	19,253	15,029	16,659

One of the London reviews of Oct. 6 describes the situation in the following words:

Month by month a larger surplus of furnace material from abroad becomes available for the smelters, and, in fact, so far this year this increase amounts to about 8000 tons fine copper, while, owing partly to the continual increase among their old customers of the practice of refining their own bars, and also the undoubted large falling off in the general demand for brass and copper work, the smelters are ill provided with work to get rid of this surplus.

It seems that the long abandoned New Quebrada copper mines of Venezuela are also to be taken in hand by English capitalists. From recent advices we learn that efforts are being made to develop another mine in Newfoundland, near the celebrated Bett's Cove mine. The new mine is situated on Green Bay, east coast of Newfoundland. It is reported by a gentleman who has visited the mine recently, that an immense body of copper has been discovered and that work is being pushed vigorously.

From 1856 to 1873 inclusive, the Spanish copper mines exported to England over 3,000,000 tons of pyrites valued at £7,000,000. They have during the last few years produced more copper than the English, German and Swedish mines collectively, and it is estimated that they will shortly be able to produce annually from 1,500,000 to 2,000,000 tons of pyrites.

What precedes will suffice to show why copper has depreciated so much in Europe, and how utterly impossible it is to form an idea as to the probable future of the metal over there from the moment that new and important sources of supply begin to unsettle statistics.

The Bessemer Combination.

It is to be regretted that the late attempt of the Bessemer steel rail manufacturers to reach an agreement to advance the price of rails, was not successful. It is understood that the plan proposed received the assent of all the mills but one, and the opposition of this one has entailed, not only upon the other mills, but upon it also, another period of low prices and no profit, if not an absolute loss.

The agreement proposed, as we noted in our Philadelphia letter week before last, was, in substance, that $2 per ton for all rails manufactured be paid into a pool, and divided at stated periods among the companies owning the Bessemer and allied patents. This sum was to be in addition to the $3 per ton royalty already paid on each ton of pig converted, and would make about $6 per ton of rails paid the pool by these mills. Rails were to be furnished at Troy for $50 per ton; at Cleveland for $50; at Chicago for $51; Joliet, Ill., $51; St. Louis, $53. The mills at other cities, comprising the Edgar Thomson Works, of Pittsburgh, Cambria Iron Company, of Johnstown, Pa.; Pennsylvania Steel Company, of Harrisburg; Bethlehem Iron Works, of Bethlehem, and the Lackawanna Iron and Coal Co., at Scranton, were to be unrestricted in their production and prices.

The arguments pro and con. on this proposition will readily occur; and while it is not the best scheme that could be devised, it is certainly better than the present system, whose only result is to constantly lower the price of rails, and render unremunerative a business that requires a vast outlay of capital in plant and the salaried employment of a large staff of skilled workmen and experts.

The course of the manufacturers of Bessemer steel seems a marvel of stupidity to on-lookers. When a small body of manufacturers have a monopoly in the production of a certain article, it is to be expected that they will take advantage of that monopoly to make money, and no exception can be taken to such a course, provided always that exorbitant profits are not charged. There are but eleven Bessemer mills in this country. They own absolutely all the patents essential to the manufacture of their products. Put the price where they choose, the only competition will be among themselves, for no other mill can be started in opposition to them. And yet, with all this in their favor, they stupidly throw the opportunity away and sell rails at a price below that for which they can be made. All things considered, $5 a ton would be a low profit. Rails should command a price that would average this rate, and no consumer should be unwilling to allow it. But by the refusal of one mill to see as ten other mills do, all profit is thrown away; 25 to 30 millions of dollars of invested capital is rendered unremunerative, for the most part, and bankruptcy ahead if the present status continues.

We do not know the prospect for an agreement, but it seems the simplest kind of wisdom for mills situated as the Bessemer mills of this country are, to reach some common basis of action. Jealousies and ambitious pride should not stand in the way of reasonable men seeing in what direction their interests lie and following them.

At a recent meeting of the Amalgamated Association of Iron and Steel Workers, held at Youngstown, Ohio the assertion was formally made, in the shape of a resolution, to the effect that there has been shipped into this country, within the last three months, duty free, 2,000,000 tons of old rails. This is a large-sized bugaboo to "shoo" with, but it is fortunately so large that it causes laughter rather than fright. No iron is admitted duty free; wrought scrap pays $8 per ton, and this would be the classification for railroad iron for remanufacture. In the second place, there has been no such amount received in this country. Nearly all that comes to the United States is exported from Great Britain, and the entire export from that country to this of all kinds of scrap iron for the nine months ending September 31, 1877, was but 2549 tons. Quite a falling off from 2,000,000 tons.

The Advance in Lead.

In September last we had occasion to speak at length in regard to the position of the lead market here and in Europe. There was little prospect for an improvement in its value on this side of the Atlantic, the active season having already passed. Early in October, however, the usual operators in lead in this market deemed the moment propitious for large speculative purchases, the more so as the price had sunk to a figure which could hardly fail to curtail production, while at the same time the question was already seriously mooted whether, at the low price of 4c., currency, it would not pay to export California lead from San Francisco to China. These speculative purchases proved that those best able to judge the position of Lead had confidence in its future, from the moment that such questions began to be seriously considered here and at the places of production. Since then both dealers and consumers have evinced some anxiety to replenish stocks, and the consequence has been a gradual rise, which may make further progress according to the views and necessities which the immediate future may develop.

The decline from 6¾c., currency, in the spring to 4¼c., currency, in the fall, was indeed unexampled in the history of lead in this market, and could only be brought about by great uneasiness as to the possible extent of the overproduction out West that was known to be going on through the summer months. That this excessive production was not quite as large as it was reputed to be, operators no doubt discovered when they resolved to control the market, and they now consider themselves in a strong position, notwithstanding the fact that we are fast approaching the dullness of midwinter.

In Europe the improvement was checked when an advance of 10/ per ton had been attained in September. At the prices now current Spain seems to resume shipments, and these reach England much faster than in former years, owing to more ample facilities for transportation from the mines to the coast, and thence by steam to Liverpool or London. The large dividends paid by the Linares Company during the past twelve months go to prove how profitable lead mining is in Andalusia. These summed up no less than 25 per cent. on the paid-up share capital. But the Spanish mines are more favorably situated than any other on the globe now that railroads have been everywhere introduced in Spain. The import of Spanish lead into England is steadily increasing, but, on the other hand, the war demand for the East is great, and this is the principal reason why lead prices are so well supported on the other side, since the trade demand is by no means a brisk one.

During the first eight months of the year there were imported into the United Kingdom 63,482 tons of lead, against 52,240 in 1876 and 52,240 in 1875, while the export was 28,237, against 24,277 and 22,779. But for the raging of a big war somewhere in Europe whose end cannot yet be seen, this comparatively large import, principally from Spain, in a year when trade is so dull, would have caused quite a decline in the London market.

While, therefore, the increased output in Spain does not disquiet the holders of lead on the other side, the greater confidence which the metal has begun to inspire after it had given way 37 per cent., now tends to place it once more on a more solid footing on this side also.

Scientific and Technical Notes.

The Graupen Tin Works at Mariaschein, in Bohemia, are making an article which they call

PHOSPHOR-TIN,

which is of great value in the manufacture of phosphor-bronze. Phosphor-tin holding more than 5 per cent of phosphorus is not constant, but with 5 per cent it is so to such a degree that no phosphorus is evolved by recasting. Its melting point is 500 degrees C.; it thus approaches that of bronze, and, consequently, the mixture with the copper tin alloy is more intimate. Phosphorus removes the oxides contained in the bronze, which are prejudicial to its strength and harden it, so that only half the quantity of phosphor-tin is used, compared to pure tin alone. The addition makes the bronze more fluid and adds to its power of resistance against acids. It withstands the action of sea water for a period three times greater than copper. As the various grades of phosphor-tin sold contain an unvarying percentage of phosphorus, bronze may be made with them which have a definite percentage of phosphorus.

In 1875, the Central Commission of Steam Boilers of France, had its attention called to the external

CORROSION OF STEAM BOILERS BY SULPHURIC ACID,

which was in one case directly proved by an analysis. The conclusion arrived at by M. Hauet-Clery, who was detailed to make an examination, is that the formation of sulphuric acid is due to an oxidation of sulphurous acid in the presence of moisture. The latter, he says, may come from leaks, or by condensation of steam in contact with colder iron. To this explanation of the origin of sulphuric acid, A. Lencauchez, in a later communication, adds another which is very probably correct. Coal contains, almost always, varying amounts of iron pyrites, which, if the coal is not immediately used, but stored in the open air, will be disintegrated. The sulphate of iron thus formed, when exposed to a temperature of from 644 to 932 degrees Fahr. is decomposed, and free sulphuric acid escapes which is highly corrosive. The remedy for the evil of corrosion by sulphuric acid which the latter mode of origin would point to, is to use no coal stored long in the open air, but if it is necessary to store, to bring it into closed sheds.

Mr. R. Adam, of Coatbridge, England, has invented an

IMPROVED WATER MOTOR,

which depends for its action upon the well-known law of the increase of pressure of a fluid jet as its velocity is diminished. The motor consists of a wheel or disk carried on a revolving shaft, and contained within a closed casing in which it is free to rotate. The wheel or disk is formed at its circumference with teeth, which are straight on one side and curved or inclined on the opposite side. At a point in the circumference of the casing, between the interior of which and the circumference of the wheel there is a clear or free space, a nozzle of a small bore is situated longitudinally, or approximately so, and this being in connection with a source of water supply at high pressure, admits a small jet of water at the high velocity corresponding to the pressure to the interior of the casing. This jet of water, after it escapes from the nozzle, strikes (at a tangent or nearly so) the straight side of the teeth in the circumference of the wheel or disk, and its velocity becoming reduced, it escapes by the outflow formed at an opposite point or other part of the casing. The inclined or curved side of the teeth in the wheel or disk enables it to rotate in the water with a minimum of retardation.

The French have a very ingenious plan for locating an obstruction, thus

OVERCOMING A DIFFICULTY IN PNEUMATIC TRANSMISSION

that has often been a source of great expense. It appears, when an obstruction exists anywhere in the underground tubes, its location is determined by firing a pistol into the tube; the resulting wave of compressed air, traversing the tube at the rate of a 1000 feet a second, strikes the obstruction, and is then reflected back to its origin, where it strikes against a delicate diaphragm, and its arrival is recorded electrically upon a very sensitive chronograph, on which also the instant of firing the pistol had been duly recorded. The wave of sound, on reaching the diaphragm, is recorded, and thence reflected back, and a second time strikes the obstacle and returns to the diaphragm. This operation is several times repeated, so that several successive measurements can be made of the time required by the sound wave to traverse to and fro within the pneumatic tube.

The recent discovery of a

NON-POISONOUS GREEN COLORING FOR PICKLES AND CANNED GOODS,

is a matter of so much general interest to every one as to be well worth attention. The use of poisonous coloring materials has become so extensive as to be a serious source of danger to all classes of the community. Indeed, it is hardly possible to buy any kind of pickles or green canned fruit, like peas, that have not had their color increased by the addition of some of the poisonous salts of copper. In the preparation of preserved and canned vegetables, the use of copper salts to brighten the color is so general, that Pasteur declared recently that it was scarcely possible to find a single box of shelled peas in all Paris in which copper could not be detected. As a justification of this, the unsalable character of the brownish-green uncolored goods is urged. Fremy has recently published some new and rather startling experiments in regard to chlorophyl, the green coloring matter of leaves. This substance, which is harmless, has been investigated by M. M. Guillemare and Letecour, and successfully used for brightening canned fruits, pickles, etc. In regard to this, *Dingler's Journal*, a standard authority, says: "Hence, from a sanitary point of view, we greet with pleasure the discovery, by Guillemare and Letecour, of a substance which will render the use of poisonous matters unnecessary and superfluous. They color the vegetables with chlorophyl. Their process is as follows: Spinach or leguminous leaves are treated with caustic soda, in which the chlorophyl is soluble. The solution is now precipitated with alum, and the lake thus formed well washed. It is then dissolved in sodium phosphate, which has previously been saturated with acid calcium phosphate. When vegetables are heated for five minutes or more with this solution, they take up the chlorophyl and hold it so firmly that they will not give it up subsequently by heating to 117 degrees C. (242 degrees Fahr.) in the can or boxes in which they are to be kept or sold."

Mr. Eugene F. Lewis and Mr. Luzerne Spaulding, of Norwich, Conn., have invented

A NOISELESS EXHAUSTER FOR VACUUM BRAKES,

which has been put on the Sargent engine, of the Boston and Albany Railroad, for testing. The main principle is in turning the engine's cylinders into air pumps, thus producing by the pistons' motion a vacuum action on the brakes even more satisfactory than the regular "jet" or ejector brake, whose noise has become a nuisance. All the cylinders are connected with a pipe which passes under the cab, where a combination valve is under the control of the engineer. By pulling the lever a certain distance the brakes are operated by the power from the pistons, and this would be the ordinary manner of use, but by pulling it still further, when sudden stoppage is desired, connection is made with the vacuum drum at the rear of the tender, which has a capacity of 3,500,000 cubic inches in which a 25-inch vacuum is maintained. Steam being shut off, and the reversing lever put in at the 6-inch notch, at which it is found the engine produces the best vacuum, the pistons at once begin pumping out the air, cage checks preventing any backward flow, and the action exhausting the air in the drum, when not required on the train. The engineer can release the train in an instant by admitting air to the pipes under the cab. This appliance costs upward of $200 per engine, but no steam is needed. On a long down grade, as from Pittsfield to Chester, the regular boiler pressure need not be kept up to work the brakes as at present, and the ear-splitting noise of the present form of ejector is entirely avoided. The only apparent drawback is that, in not giving the valve full play, as is usual in shutting off steam, the valve seat may be worn uneven; but the inventor thinks there is no danger. Owing to the large cylinders of the Boston and Albany engines, one-quarter greater power is expected than has yet been obtained. The brake has been successfully tested by the Norwich and Worcester Railroad authorities, who highly recommend it.

A correspondent, writing of a recent reconnaissance of the Turkish fleet toward Sebastapol, says: "Before concluding, I may say a few words respecting the admirable manner in which the concentration of the enemy's fire was managed. They had evidently adopted the Siemens and Halske's

STADIOMETER OR DISTANCE MEASURER,

an instrument by which the position of any vessel entering a harbor or the distance of any object in view can be ascertained at a moment's notice. Two observers are required at the end of a base line, and they have merely to follow the motions of the object, if moving, or bring it in the center of the field of their respective telescopes. The observer at the one end has his telescope affixed to a table on which is spread a chart of the harbor mapped off into squares, each of which is numbered. The pedestal of his telescope carries a light pointer, either of glass or a light, open, narrow frame. At the other end of this table is a similar pointer, attached to machinery placed in a small box underneath, which is worked by currents of electricity sent from an electro-magnetic battery at the other station. The moving of the telescope, in fact, causes the rotatory motion necessary for the induction of the electricity, and everything is so adjusted that the movements of this telescope and of the pointer at the table shall always correspond. When both the telescopes are pointed at the same object the pointers cross, and the scale of the chart being in accordance with and in proportion to the length of the base line, the point of intersection naturally shows the section of the harbor in which the object is to be found. Similar maps being placed in all the forts and batteries, it is very easy to communicate by flashing signals the number of the square in which an enemy's ship happens to be, and thus the range at each point can be at once ascertained, and the guns laid accordingly. During the day, when the sun is shining, mirrors answer this purpose admirably; and at night the flashing of a lantern will equally well serve to telegraph the required information.

American Institute of Mining Engineers.

(Concluded.)

ON COPPER MINING ON LAKE SUPERIOR.

The copper mines of Lake Superior are not uniform in character. They may be divided into two classes—mass mines and stamp mines. The mass mines contain massive copper in the vein rock in bodies varying in size, reaching at times great dimensions. Thus, in the Minnesota Mine, a body weighing 350 tons was struck which took 18 months to get out. In the National Mine a mass was found which was estimated to weigh about 1000 tons. In the Phœnix Mine one of 600 tons was found. The ore consists, besides masses of native copper, of barrel stuff, or pieces too large to go into the stamps, and stamp rock.

In ordinary stamp mines we may distinguish amygdaloid mines and conglomerate mines. The former are, as a general rule, very poor. Thus, as an extreme case, the Atlantic mine may be cited, the ore of which yielded, in 1875, but ¾ of 1 per cent. of copper, a quantity large enough to give a profit, though it did not warrant a dividend. The conglomerate mines have a higher grade of ore; thus, the Allouez carries from 1¾, but makes no profit, while the Calumet and Hecla has 4 to 6 per cent. and at this yield returns enormous profits. It required 2 per cent. ore and a daily production of 100 tons per day to declare a dividend. The strata are so contorted over long distances that they are difficult to trace, and, consequently, there is considerable uncertainty as to the equivalents of the different beds.

The conglomerates are quartzose in character about Calumet; near Houghton they grow more feldspathic. The feldspar is generally of reddish color, but is sometimes white. Besides these mineralogical changes, chemical changes also take place. At the Allouez mines the rock is very hard and of a thickness of 28 feet; at the Phœnix the bed narrows to 6 feet and is entirely decomposed, the resulting clay retaining the colors of the different ingredients of the rock. These changes make it difficult to determine what are the equivalent strata in mines one mile and a half from each other. This applies to the conglomerate mines only; it is not so with the amygdaloid deposits. An example is the difference of character between the rich Calumet and Hecla, and the Osceola, which, on the same bed and but a few hundred feet from it, has one shaft in poor rock. The thickness of the conglomerate beds varies from 16 to 20 feet; in all of them the footwall rests against amygdaloid. Whenever the latter runs into the bed it carries copper. Near the footwall there are large pebbles which are sometimes pseudomorphed into copper. The pebbles have been said to be caused by the rolling of irregular masses on the beach, but it is really a deposition of native copper in the pebbles, which are found in every stage of impregnation up to pure metallic copper. From the footwall the grain grows finer and finer. Near the surface, oxide of copper in a soft state is sometimes found, but it hardens rapidly by exposure to the air. In the center of the Allouez bed there is a very fine conglomerate called a sandslip. As the entire width is not worked at one time, this sandslip is made to form the hanging wall of the workings; beyond it copper is said to be in smaller amounts, but explorations in that direction have been insufficient, so that little is known of the real hanging wall. There is a fable in the region that because the Calumet and Hecla struck rich bodies on their 9th level, therefore richer deposits should be expected in all the conglomerated mines at the same depth. Strange as it may seem, capital has followed that delusion and many hundreds of thousands of dollars are known to have been expended in enterprises based upon that supposition.

In the Ontonagon district, in the Non Such Mine, the bed is divided into three layers. The ore at the hanging wall, 6½ feet thick, contains 1½ to 2½ to 3 per cent. of copper, the middle slate, 5 feet thick, is poorer, and the third, 3 feet thick, holding 2 per cent. of copper, contains pockets of rock rich in silver ore. This mine seems to have, so far as the uncertainties of mining will permit us to judge, a good future.

The copper of the amygdaloid veins is light; in dressing some of it floats upon the water, which entails in some mines a loss of from 30 to 40 per cent. of the total yield of the ore. The slimes cannot, as yet, be profitably treated. The impossibility of catching this float copper is a great impediment to the prosperity and development of this class of mines.

The method adopted throughout the region in laying out a mine is the following: On the outcrop, in distances 600 feet apart, shafts are staked off. Between them, in the mine, winzes are sunk. The shafts are sunk on the incline of the vein, directly in the ore, with the object of making the ore extracted pay entirely or partly for the work of sinking it.

Some of the mass mines have vertical shafts, but they are the exception. At depths of 100 feet, levels are driven. It is a mistake made that the connections between the winzes and shafts are run by hand power. The rock is hoisted from the winze by hand, a more expensive mode than that which might easily be done by introducing compressed air for the purpose, as the compressors are in position for driving the drills. In putting down shafts, two partitions are made in them, one for the transportation of the ore, the other for ascending and descending into the mine and for pumps. The timbering is done in the usual way. In some mines no rock pillar is left at the sides to protect the shaft. In the ashbed of Copper Falls mine, chambers over 150 feet square are not protected, and as the hanging wall is a friable sandstone, it is strange, but nevertheless true, that it does not come down. In some of the upper levels of the Calumet and Hecla the rock, in consequence of improper protection of the shaft, pushed much, and a large body of timber had to be used. The old Minnesota from the same cause caved in; it is now worked by tributers; but while the mine has suffered from this cause the property is still valuable.

When the mine is laid out the rock is taken out usually by overhead stoping. For this work the Ingersoll drill is used, staging being erected as the work progresses upward. An effort is always made to have one side of the rock free, which diminishes the cost of extraction. No nitroglycerine or any other explosive but powder is used. The miners complain of headache and decline to use it. An experiment, interesting on account of the conclusion arrived at, was made with chrome steel and ordinary steel as a material for drills. A rock drill furnished with chrome steel drills was operated side by side with three men using ordinary steel drills, two men hammering and one holding the drill. The latter kept up easily with the rock drill. It is probable that either from interest or ignorance the blacksmith did not temper the chrome steel correctly.

The contracts are let out in the Superior region in a peculiar manner. The mine boss sounds the rock with the head of a pick, and lets it out according to the sound of the blow, the only control being the amount earned by the miners at the end of the month. If it is too much, the contract price is lowered accordingly.

In mass mining the miner, when he strikes a "horn"—a projection indicating the presence of a mass of copper—works his way around it. If the mass is found in the main drift, it is left standing until it is no longer to be used; if in the stope, an opening is excavated below to receive it. To detach it the mass is freed as far as possible on one side and a drift run in its whole length behind it. The opening thus made is charged with a large amount of powder tamped with sand and fired, which throws the mass into the opening below. The mass of copper is cut into smaller pieces of 2½ tons maximum by a chisel, which is struck by two men and held by a third. The latter work is very painful and trying, so that the men change work every hour.

The masses are calcined in a kiln, as much rock as possible picked off, and the mass is then sent to the smelting works. The methods of hoisting are generally the same throughout the region. The rock is hoisted on a skip to the rock house, a signal man being stationed at the top to give the engineer warning of its approach. The dimensions of the skip are 4 by 3 feet and 2½ feet deep. The front wheels of the skip fall through the track and dump the ore on a screen. The large masses are block-holed and then broken up with sledges, a painful and laborious work, 12 men being occupied on it at one shaft alone. The ore then goes to a Blake crusher; it is not sorted before it is put under the stamps.

The cost of the various work is:

Drifting	$19.00 @	.....
In conglomerate, no foot	35.00 @	.....
" with a foot	20.00 @	.....
Driving in hanging wall	6.00 @	.....
Winzes	17.00 @	23.00
Shafts	37.00 @	...
Stopes, per fathom	20.00 @	23.00

The average of wages per month amounts to $47.

The method of getting into the mines is, in but one case at Calumet and Hecla, by Fahr-Kunst; in others, by ladders. At the Phœnix stairs have been introduced three to four years ago, and experience made warrants the opinion that their use will rapidly become general. Ladders with wooden rounds cost 6 cents the mining foot. The sides wear out several rounds. Iron rounds are often used. The stairs cost 12 cents the mining foot, and wear more than twice as long as the ladders without repairs. When the ladders are on an incline of 30 to 40 degrees, they are often provided with a hand rail and used as stairs.

ERRATUM.—An error, calling for correction, has found its way into the Report of the Committee on Wire Gauge in our last issue, November 1, 1877. Page 15, 4th column, line 52; for "millimeter gauges," read "micrometer gauges."

BRITISH IRON AND STEEL INSTITUTE.

Third Day's Proceedings.

IRON SLAG REMAINS IN SCOTLAND.

The President, in opening the third day's business, said that when in the North of Scotland lately, he found a heap of iron slag in a place which was utterly devoid of habitation, or of fuel or ironstone or anything else which would induce one to say that it was a proper place for the establishment of ironworks. He found there a heap of slag grown over with turf, and he caused a piece of it to be analyzed. The first feature of the slag was that there were little pieces of charcoal adhering to it all over. The following was the result of the analysis :

Protoxide iron	54.0000
Protoxide manganese	3.2554
Alumina	13.0000
Silica	22.1000
Phosphoric acid	0.2194
Sulphuric	0.1250
Lime	7.3000
	99.9998

From this analysis it would appear that a good ironstone has been used, perhaps hematite, yet one containing a great deal of alumina but little phosphoric acid. The exact place where he found this slag was at the end of a loch on the estate of Bremoor, belonging to Mr. John Fowler. It was a place destitute of wood or anything which betokened habitation, even within historic times.

MECHANICAL PUDDLING.

Mr. Richard Howson, of Middlesbrough, then read the following paper :

Having received an intimation that some account of the Godfrey and Howson puddling furnace, and of certain results which have been recently obtained with it, might be acceptable to this meeting, I gladly respond to the invitation. At the same time, I am compelled to ask that certain allowances may be made for the absence of data of a strictly accurate character. A series of trials has been carried out with this furnace with the sole object of overcoming the recognized difficulties of rotary puddling, especially those which arise from the destructive action of intense heat, and of generally cheapening the process. The attempt has met with some degree of success, but the scientific demonstration has yet to follow. It is enough for the present, if I endeavor to suggest a new starting point from which to commence an investigation of the whole theory of puddling, hoping that it may attract the attention of those most competent to deal with it. To commence with a description of the furnace, and referring to the diagrams. The acting part of the machine consists of a pan-shaped vessel mounted on an axis. This axis is inserted into a long bearing bored out in a framing situated immediately below the pan, a bevel wheel, driven by a pinion, being keyed on the axis between the bottom of the pan and the frame. The frame itself is mounted on trunnions, which allow of a tilting motion at right angles to its bearings. The shaft of the pinion which causes the revolution of the pan passes centrally through one trunnion, while on the other trunnion a worm wheel is keyed, worked by a worm, through which the tilting motion is effected. It will thus be seen that the pan can be revolved at any angle; its position can be changed through an arc of a circle, so as to bring its opening at one time in front of the source of heat, and at another to tilt out the finished ball. The center of motion is shown in the diagram as situated a little above the bottom of the pan, and the weight of the trunnion frame is adjusted so as to balance the weight of the pan and its contents. If the center of motion is placed at or near the common center of gravity, it is clear that very little power is required to effect the tilting action, and hand power is quite sufficient for the purpose; but in machines of large dimensions self-acting means may be applied without difficulty. The worm wheel action is in either case both convenient and efficient; but other modes of tilting will naturally suggest themselves, such as the hydraulic arrangement usually applied to the Bessemer converter.

The source of heat consists simply of an enlarged gas blow-pipe, the jet from which enters the mouth of the pan centrally or nearly so, while the products of combustion escape concentrically outside the tuyere and inside the edge of the pan. The gas enters from the main into an annular space just above the tuyere, and the air is forced through a nozzle placed centrally, and perforated with holes. This arrangement answers perfectly well, but it is easy to see that it is capable of modification, provided only the ordinary blow-pipe conditions are complied with, viz., that the air mixes thoroughly with the gas, and that the focus of most intense heat may be somewhere near the surface of the metal under manipulation. The nose of the outer tuyere is protected from the heat by means of a coil, after the manner of a blast furnace, but instead of water it is sufficient to allow a small jet of steam to circulate through it, this alternative being designed to obviate the consequences of a leak, which might result in a chance explosion in the pan. The air nozzle itself requires no protection. The method of applying the blow-pipe action to the operation of puddling was first tried at the Newport Iron Works with a small stationary furnace, in the year 1867, the air being supplied from the hot main of a blast furnace. The heat of the air, originally about 900 degrees, was reduced to about 500 degrees, by having to pass for a considerable distance through pipes exposed to cold. The gas was generated in an apparatus very similar to the ordinary Siemens producer, and the jet of mingled gas and air was projected vertically down on to the hearth. The temperature attained in the furnace in this manner was amply sufficient for puddling, but when blast furnace gas was substituted, the heat was found to be inadequate. Some account of these experiments will be found in a report of the puddling committee appointed by the Institute, and published in the *Journal*, of 1872, vol. i., p. 102. It may be stated that the entire results were successsful so far as the process is concerned; but the manual labor was somewhat trying, owing to the heat caused by the internal pressure forcing a portion of the products of combustion through the rabble hole. It was apparent at the time that the only solution of the difficulty was mechanical puddling, and the revolving construction naturally suggested itself, but the project was not carried out.

The next series of trials were made by Mr. Godfrey and myself, with the assistance of Mr. Williams, at Messrs. Bolckow & Vaughan's works, in the year 1875. The source of heat employed in this instance was ordinary illuminating gas, taken from the company's gas-holder. In a small stationary furnace a number of preliminary experiments were made in order to determine the best form of burner, the best focal distance of the jet, and the influence of pressure in the interior of furnace. It is sufficient to say that an intense heat was obtainable with hot blast, and even with cold quite high enough for all practical purposes, and it now became a question how far retort gas would compete with the old method of coal firing in an economical point of view. In order to ascertain this, a large gas meter was fitted to the supply pipe and the consumption accurately taken. Without entering into details, it may be stated that these trials showed that, even under imperfect conditions, a ton of iron could be puddled with 2500 cubic feet of gas, provided the pig iron was first melted in a cupola. This would bring the consumption of coal, if of good gas-making quality, to 5 cwt. per ton of iron, the residual coke being available for melting or for steam purposes.

With regard to the gas manufacturing plant, it may be calculated that one bench of five retorts in a group would be equal to the production of 100 tons of puddled bars per week. Having proceeded so far, two revolving furnaces of small dimensions were now constructed, sufficient, however, to put to the test the experience already gained. The one was made so as to revolve horizontally, with an opening at each end, opposite to both of which a blow-pipe was situated, so that the foci of two jets met in the center of the chamber, the products of combustion recoiling and returning concentrically past the jets through the same openings. The other furnace was of similar construction to that already described. From the description of the latter, it will have been noticed that the orifice of the furnace is entirely free from the nose of the tuyere, and that, consequently, there is no frictional contact with it. It had already become apparent that, with the ordinary system of coal firing as in the Danks furnace, the necessity of forcing the two ends of the revolving vessel into close contact with two rings subjected to excessive heat, was the cause of great waste of steam power and rapid destructive action, and that the blow-pipe arrangement furnished the means of obviating the evil. This feature was accordingly adhered to in both cases, that the openings of the furnace were free from touching any rubbing surface. At this period, the system of boiling under an intense heat was the only means of producing finished iron of good quality. The higher the boil, the better the result, and the consequence was that, on the horizontal plan, the orifices of the chamber required to be very small, compared with its internal capacity, to prevent boiling over. On the other hand, the arrangement shown in the diagram enabled the pan to be tilted at the point of the highest boil, so as to keep in its contents. Allowing for minor defects, always incidental to first attempts, both furnaces gave results sufficiently satisfactory to warrant the construction of larger ones on a commercial scale. The freedom from smoke and dirt formed a striking contrast to the comfortless aspect of an ordinary forge, while the labor was light in comparison, and, economically, the prospect was encouraging. In the latter respect, indeed, considering the heating power of retort gas, its purity and the cheapness with which it can be manufactured, when apart from the expensive and wasteful system of town mains, there seemed good reason for inferring that its application to iron making would be an advantageous one. The first construction, however, of a plant of this kind is obviously expensive, so much so as to discourage its adoption on a large working scale. It was thought advisable, therefore, to recur to the cheaper method of manufacturing gas, which, although more impure, was known to answer the purpose.

Another furnace, large enough to puddle from 3 to 4 cwts. at a time, was now erected at the Britannia Works, the construction adopted being the one shown in the diagram for the reason above mentioned, that it afforded most room for boiling. The apparatus selected for generating the gas was that of Messrs. Brook & Wilson, as it seemed to offer points of special adaptation to the requirements of the case. This gas producer is shown by means of two sections in the accompanying diagram. It consists of a combustion chamber having a solid hearth and no fire bars. The coal is fed from the top, the combustion takes place at the bottom, and the gas escapes intermediately between the two, through lateral openings into a channel which passes round the chamber, and from which channel it is conducted into a main communicating with the furnace, or with a number of furnaces. The air required for combustion is supplied by means of the well-known steam jet, blowing into a bell-mouthed pipe placed outside, but mounted on a box-shaped casting which traverses the middle of the chamber. On each side of this box, in the interior, there are openings through which the mingled air and steam find their way into the charge. The object of placing these openings in a central position is to prevent any currents from passing up the sides of the chamber in an undecomposed state and contaminating the gas, as they are liable to do unless the proper precautions are taken. The steam jet presents an obvious advantage, as it gives command of pressure at the tuyere to assist the blow-pipe action, affording at the same time a ready means of adjustment so as to regulate the rate of combustion and the formation of gas according to requirement. In other respects this form of produce works well and has the merit of cheapness in construction.

Referring again to the furnace itself, the pipe which conducts the gas from the main

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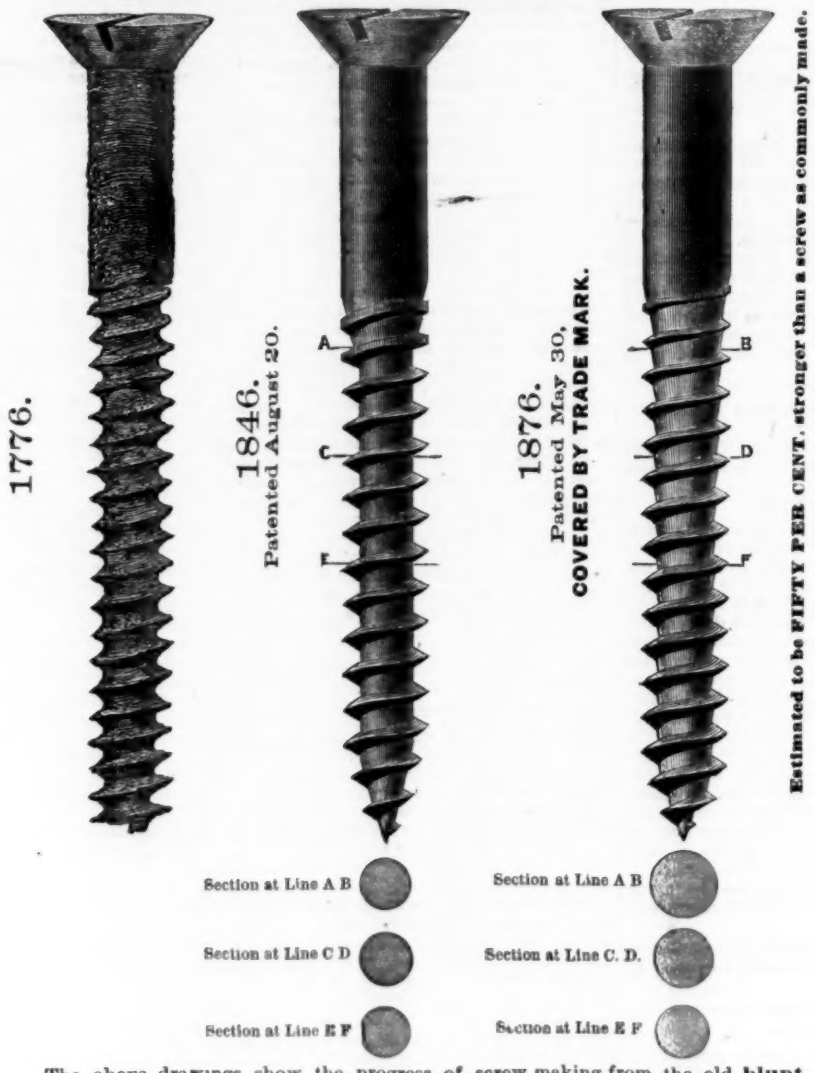

The above drawings show the progress of screw making from the old **blunt point** to style now adopted.

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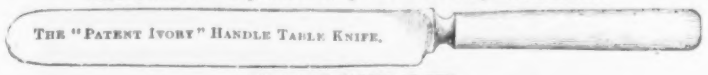

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Importer on Commission

OF

HARDWARE, CUTLERY, GUNS, &c.

W. SANDERS, Agent,

76 Reade Street, N. Y.

Cutlery.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son.

"Limited."

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

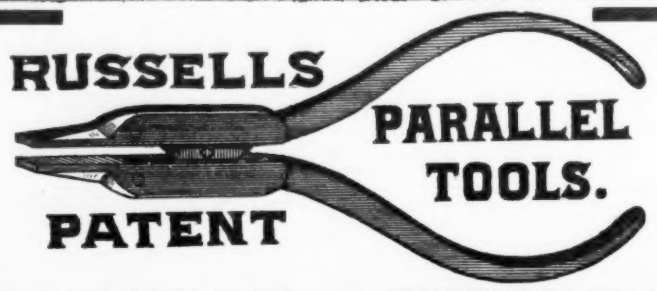
Rotherham, ENGLAND.

Corporate Mark.

NO SPENCER ROTHERHAM

Granted 1777.

RUSSELLS



PARALLEL TOOLS.

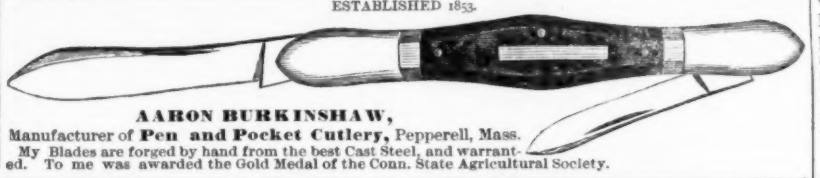
PATENT

HAGSTOZ & THORPE,

Sole Manufacturers and Proprietors.

Sixth and Chestnut Sts., Philadelphia, Pa.

ESTABLISHED 1853.



AARON BURKINSHAW,

Manufacturer of **Pen and Pocket Cutlery,** Pepperell, Mass.

My Blades are forged by hand from the best Cast Steel, and warranted. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.

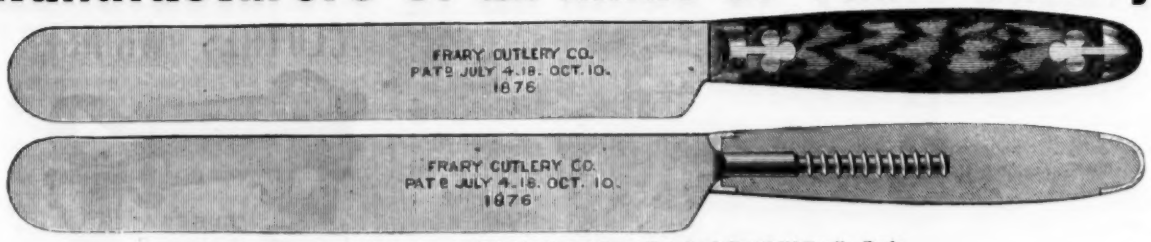
THE "ORLEANS."

Factories, Wallingford, Conn. **Salesroom, 75 Chambers Street, New York.**

THE FRARY CUTLERY COMPANY,

FACTORY, Bridgeport, Conn. *NEW YORK OFFICE & WAREHOUSE, No. 82 Chambers St.*

Manufacturers of all kinds of Table Cutlery.



The above Illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle Knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the Knife or Fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

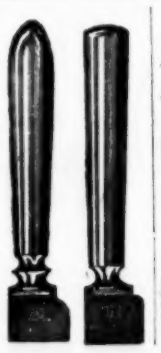
SILVER PLATED SOLID STEEL HANDLE KNIVES.

We guarantee 12 dwts. of fine silver on each dozen of Table or Medium Knives. All our Spoons, Forks, &c., made of 18 per cent. Nickel Silver. We warrant our extra plate

On TEA SPOONS	2½	ounces per gross.
" DESSERT SPOONS	3¾	" "
" TABLE SPOONS	5	" "
" DESSERT FORKS	3¾	" "
" MEDIUM FORKS	5	" "

THE ROGERS CUTLERY CO. TRADE MARK

P. O. Box 204. **HARTFORD, CONN.**



ALFRED H. HILDICK,

12 Warren St., N. Y., Importer of

Birmingham Heavy Hardware, Chains, Anvils, Vises, &c.

Agency of HILL BROS. & CO., WALSALL, ENGLAND, GENERAL HARDWARE MERCHANTS,

And of

Ball's Pat. Solid Steel Sheep Shears.

These Shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use, either in the bow or at the junction of shank and blade. Samples can be seen at above address, or sample lots furnished. Depot for "THE CROWN" SOLID BOX VISES. A cheap and excellent Vise.

VAN WART, SON & CO.

Hardware Commission Merchants.

EXPORTERS AND IMPORTERS,

BIRMINGHAM, - ENGLAND.

Agents,

McCOY & COMPANY,

134 & 136 Duane Street, N. Y.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammock

McCOY & COMPANY,

BORAX A SPECIALTY,

134 & 136 Duane St., New York.

Established 1853.

AMERICAN SHEAR CO.

Manufacturers of

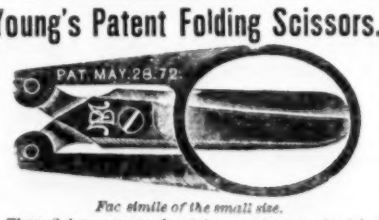
Pen and Pocket Cutlery,

Shears, Scissors and Pruning Shears,

HOTCHKISSVILLE, CONN.

Salesroom, **298 Broadway, New York,** with LANDERS, FRARY & CLARK.

Young's Patent Folding Scissors.



Fac simile of the small size.

These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, *to the trade only*, upon receipt of the retail price, namely:

For small size, either blunt or pointed.....$1·00
Large size, pointed or half pointed..... 1·50

New York, Feb. 1st, 1876.

MARX BROS., Proprietors,
430 Broadway.

PROTECT THE WALLS.

The Star Friction Mat,

To light Matches on.

THE STAR FRICTION MAT,

With Pocket to hold the Matches.

Send for illustrated price list.

J. B. COLT & CO., Manufacturers of **NOTIONS.**

Factory, Brooklyn, L. I. Salesroom, 207 Broadway, N. Y.

SPECIALTIES TO ORDER.

to the tuyere is fitted with a simple valve for shutting off the gas and regulating its supply. There is also a valve attached to the air pipe for a similar purpose. The blast is in the present instance obtained from a Root's blower, although, if the system were worked on a large scale, a small blowing engine would be preferable. The pressure of air which appears to be most suitable so far, may be stated to be about 12 inches of water, although this perhaps may be considered an undecided question. It is, of course, an essential point that the blast should be divided into streams so as to intermingle with the issuing gas as rapidly as possible. There is, however, no difficulty about this. It might be supposed that, owing to the short distance which the jet has to traverse, an oxidizing action would be liable to take place at the surface of the metal, owing to the presence of free oxygen. Nevertheless, this is not the case. It is certainly possible to have an excess of air, which is in fact sometimes an advantage, but it is also possible and even easy to adjust the jet so that the whole of the oxygen is consumed before the charge is reached. In like manner a reducing flame is readily obtainable by giving an excess of gas, but this, so far, does not appear to answer any useful object. The products of combustion leave the pan, as already described, between its inner rim and the nose of the tuyere, and the conditions are best fulfilled when only little flame is apparent. In any case, the burnt gases, whether incandescent or not, after issuing from the pan, have a high temperature. This waste heat is, therefore, conveniently utilized by allowing it to pass on its way to the atmosphere by a vertical chamber traversed by a series of heating pipes though which the air is forced on its way to the tuyere. In actual fact, hot blast is not necessary in the process presently to be described, but it tends to economy to take advantage of heat which would otherwise go to waste. The temperature of blast thus attainable has been proved to reach to as much as 800 degrees. It may be added that under all conditions with this furnace there is a complete absence of smoke.

I now come to the subject of some recent experimental trials in the process of puddling, which, I hope, may be considered worth the attention of the meeting. It has already been observed that it is one of the distinctive features of this furnace that the destructive and power-absorbing action of frictional contact in the revolving vessel is avoided. Those who have struggled with the difficulties involved in ordinary coal firing as applied to rotary furnaces, will no doubt recognize the advantage of the blow-pipe system in this respect. But this is not enough. In the method of puddling hitherto adopted, the necessities of the case require a comparatively intense heat in order to obtain a good boil and facility of balling up. This causes, in the first place, a wasteful expenditure of fettling (leaving the fuel out of the question), and in the second place, a distorting and dilapidating influence on the entire structure of the furnace, which can only be mitigated by a liberal use of water. At the last meeting of the Institute, I ventured to express a belief that the entire process of puddling might be effected under a temperature so moderated as to overcome these difficulties. Since then my attention has been mainly directed to the attainment of this desirable end, and, as before stated, with some degree of success.

Without going into the history of mistakes and failures, which have been numerous enough, I may briefly describe the new process, as it at present stands. In the first place, it may be stated that the system is capable of modification in accordance with the quality of pig metal, and with its previous treatment. For instance, the metal may be taken directly from the blast furnace, or after a second melting in a cupola or reverberatory furnace, or it may be melted in the puddling furnace itself. Up to the present, owing to deficiency of appliances, I have only had experience of working with metal previously melted in a reverberatory furnace with a cinder botton. Under such conditions, if rapidly effected, the melted iron does not greatly differ from that which is tapped from a cupola. With Cleveland pig thus treated the silcon may, perhaps, on the average be taken at 1¼ per cent., and the phosphorus from 1 to 1¼ per cent. The metal having been melted and transferred by means of a ladle to the puddling furnace, the pan is now revolved at a moderate speed, ten revolutions per minute being a convenient rate. Assuming that the pan is fairly red hot before the introduction of the metal, no gas is required. An excessive heat is better avoided. The charge being thus put in motion, the next thing is to add the fettling in the shape of ground oxides in a cold state or slightly heated. Melted fettling is not employed at all. The oxides are simply sprinkled gradually on to the surface of the metal, which rolls up the granulated particles among its mass, and rapidly becomes thereby of a thick, pasty consistency, emitting carbonic oxide flames abundantly. It then presently rises in temperature, owing to its own internal chemical action, and becomes liquid again, but not with the usual appearance. The whole of the metal has assumed a granulated condition, swimming like rice grains in a bath of cinder. The carbon continues to escape in flames, but without boiling, until the grains get viscous and have a tendency to stick together. Now is the time to check the speed of the machine. From this point to the end of the process the rate of revolution should not be more than two per minute. Still no gas, or very little, is required. No more heat is necessary than will keep the cinder in a liquid state. In the course of some minutes the flames begin to diminish, and the tendency of the grains to adhere increases until at last they collect together in small ragged masses. This is the period above all when an extremely slow motion is requisite, in order to prevent the formation of crude lumps before the iron has been properly converted. The longer it is kept in a loose and spongy state the better. As soon as the carbon flames have vanished, or nearly so, a spurt of heat finishes the operation, and the iron may be balled up. The final stage is the most difficult part of the process. If the metal is allowed to coagulate into compact masses too soon, the

operation is prolonged and the result is unsatisfactory. Precaution, therefore, is necessary to prevent this, which can only be done by an extremely slow motion of the pan, or by stopping it occasionally altogether.

In this method of puddling, as before stated, there is no boiling. The charge naturally swells somewhat, but this is all. The heat required is comparatively low, and consequently the consumption of gas is small. The quantity of dry oxides required need not exceed 3 cwt. to the ton of blooms, and there is no other expenditure of fettling. As a proof of this, it may be stated that considerably over 100 heats have been got out of a furnace without any repair to the lining. Of course, under these circumstances, the outer shell does not suffer in any way, and no water has ever been applied to any part for the purpose of cooling it.

With so small a consumption of fettling, the question may be asked, "What becomes of the phosphorus?" The reply to this is that, when working at low temperatures, the phosphorus appears to prefer the cinder to the iron. The cinder squeezed out of a bloom so puddled may contain 7 or 8 per cent. of phosphorus, while the bloom itself contains not more that 0.15 per cent. It must be noted, however, as a tolerably ascertained fact, that if the ball is kept too long a time at a high temperature before going to the hammer, a part of the phosphorus goes back into the iron. With regard to the waste which accompanies this method of puddling, I should estimate it at somewhat less than that of ordinary hand puddling; but of this and of some other questions it is not possible at present to render a very precise account. When the conditions of a series of experiments are constantly changing, exact determinations are not very easy to effect. Taking the subject altogether, it would not be difficult, in the usual advertisement fashion, to sum up all the advantages of the furnace and system of manipulation which I have attempted to describe. At present, however, I forbear, having already apologized for the somewhat crude and premature nature of the information I have had to give. In a short time I hope to be in possession of more accurate data, so as to be able to present the subject in a more complete form.

(To be continued.)

The Southern Trade.

The Boston *Commercial Bulletin* speaks very encouragingly of the Southern trade, its rapid increase and great value.

One of the most noticeble features of the Southern trade of the last two or three years is the greatly improved financial condition of the buyers.

It says: "This is specially apparent to Northern business houses which in ante-bellum days had Southern customers. There was wealth in the South, then, it is true, but the effect of the labor system of that section was demoralizing in every direction, and especially in building up a system of trade in which long credits were a prominent feature. As a rule, the Southern planters bought all their supplies, for themselves and their vast establishments, on long credits, settling their bills once a year when the cotton crop was gathered and sold. As a rule, too, the planter entrusted his business—the purchase of his supplies and the sale of his products—largely to his factor, who cared more for his commissions than he did for the interests of his employer. Generally, the cotton crop was largely eaten up before it was marketed, and the greatest part of the money realized by the sale of the crop went to pay bills for provisions already consumed.

The changes in the labor system have been followed by changes in business methods. Not compelled to feed his "help," the Southern planter has become more independent of his factor. Compelled to conduct his business carefully, he has given more personal attention, to it than formerly. Southern credit at the North having been partially destroyed, and a generally shortening up of all credits having been established, the Southern merchant has been obliged to purchase only the goods which could be readily turned into cash, for the settlement of bills. In this way the South has, as we have said, greatly improved its system of doing business. The change may perhaps be summed up in a single sentence: Formerly the ability to pay debts already contracted depended upon the success of the cotton crop; now the ability to purchase goods for the succeeding season is the only thing thus dependent. Because ability to pay debts is far less dependent upon large crops than it was years ago, the credit of the South has greatly improved.

The cotton crop now being gathered is a very heavy one, and as it is not mortgaged to factors, it will put money into the hands of the people, for the purchase of the necessaries and luxuries of life. The purchases of merchandise from the South are large already, and the prospects for a heavy demand from that section is a very encouraging one—better than at any time since the close of the war."

In addition to these facts noticed by the *Bulletin*, we may mention the increased Southern demand for machinery of all kinds, showing a tendency not only to use labor-saving machinery, but to go into manufactures whenever it is practicable.

Important Brazilian Railway Contract.

For some time past efforts have been made to increase the trade of Philadelphia with Brazil, and the president of the Reading Railroad Company has been unremitting in his efforts to that end. Mr. Gowen has just received a cable telegram from London announcing the execution of the contract there between The Madeira and Mamoré Railroad Company (Limited), The National Bolivian Navigation Company, and Messrs. P. & T. Collins, contractors, of this city, by which the latter agree to complete the grading, masonry and superstructure, and furnish the equipment of the railroad of the first-named company. This road is projected from the present head of navigation on the Madeira River, a branch of the Amazon, in Brazil, to Bananeira Falls, on the Mamoré River, on the borders of Bolivia, and is about 180 miles long, embracing the falls and rapids, which now render navigation impracticable. It is designed as a narrow-gauge road, with iron rails of 45 pounds per yard, and will be used to transport the products of the Atlantic slopes of the Andes to the navigable waters of the Madeira River and thence down the Amazon. By an agreement with the contractors, the Philadelphia and Reading Coal and Iron Company will supply all the rails and other ironwork and materials that will be required to construct and equip the road. This is a first and most important opening of trade between this port and Brazil. The equipment will include locomotives, cars, rails, spikes, bolts, chairs, turn-tables, &c., and the total cost of the road is said to be $5,000,000. The payments to the contractors will be about three-quarters in cash, for which the money is now in hand, and the remainder in the debentures of the railway company, guaranteed by the Brazilian Government. The Philadelphia and Reading Coal and Iron Company will receive immediate cash payments on shipment of the materials from the port of Philadelphia.

The following item from the London *Times* shows an increased activity in England in a direction intimately associated with progress in industry and arts: The Commissioners of Patents, in their report of last year, which has just been used in a Parliamentary paper, state that the number of applications during the year exceeded those of any former year, being 5069. After deducting the patents not completed, and the number lapsed, there were 3367 remaining in force.

A. J. NELLIS & CO.,

Pittsburgh.

Manufacturers of Steel or Wrought and Malleable Iron Fencings, Castings, Railings, &c., warranted free from breakages. Special attention given to orders for approved designs for Cemeteries. Also, manufacturers of Agricultural Steels of all descriptions.

Steels finished and tempered by NELLIS' PROCESS to suit any kind of soil. Special attention given to the manufacture of Nellis' Original Harpoon Horse Hay Fork Grapple and Wood Wheel Wrought Frame Horse Fork Pulleys. ☞ Medal awards on all goods of our manufacture exhibited at the Centennial.

Steel Castings,

Light and heavy **Steel Castings** of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

EUREKA CAST STEEL CO., Chester, Pa.

Office: 307 Walnut St., Phila.

A X E S

BEST BRANDS SOLD.

X BULLION, A

$9.50 per doz.

E LIPPINCOTT'S, X

$9 per doz.

S DIAMOND, E

$8 per doz. Cash, 30 days.

A X E S

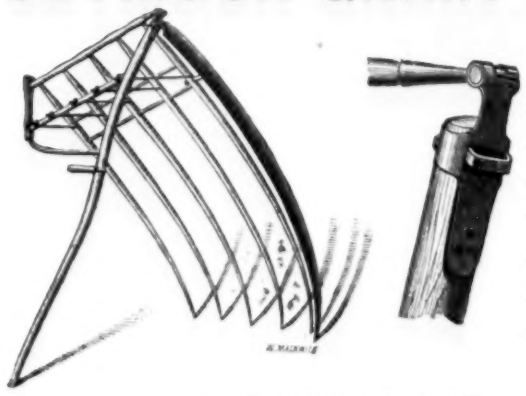
Made in PITTSBURGH by

HUBBARD, BAKEWELL & CO.

Sold by

Everyone who keeps good Hardware.

SEYMOUR GRAIN CRADLES



A new and important improvement that avoids the old ring fastening, and furnishes an adjustable socket by which the cradle head may be easily attached or detached, and the scythe much more readily fitted

"CREEDMOOR," CLOW'S PATENT.

SEMPLE & BIRGE MFG. CO., St. Louis. Mo.

HOBART'S TACKS

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN,

ESTABLISHED 1810.

Office and Salesroom, 116 Chambers Street, New York. - - - - Factory, South Abington, Mass.

Any Kind of Wire Nails made to order from Description, or Samples.

American and Swedes Iron Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners' Copper, Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points,

Iron, Steel, Copper and Zinc Shoe Nails, Patent Improved Brass Shoe Nails,

Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails,

A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and Irregular Sizes made to order or cut from sample at short notice. **Send for Price List.**

THE EAGLE ANVIL!! WARRANTED!!

(ESTABLISHED) 1843.

These Anvils are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern) and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more *solid* material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one fifth lighter* than that required when using a wrought iron anvil.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel*. The body of the Anvil is of the strongest grade of American iron, to which the ca steel face is *warranted to be thoroughly welded and not to come off*.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 lbs., 9c. per lb. Smaller Anvils, ("Minims.")

No.	00	0	1	2	3	4	5	6	7	8	9
Weighing about	5 lb.	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
	$2·25	$2·75	$3·25	$4·00	$4·50	$5·25	$6·00	$6·50	$7·25	$8·00	$8·50

N.B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)

New York.—Messrs. TENNIS & WILSON.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO., Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE Louisville.—Messrs. W. B. BELKNAP & CO. **FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.**

THE

Keystone

Wringers

Have all the Latest Improvements,

And are made in a variety of styles—Wood Frame, Iron Frame, with Common Gears, Purchase Gears or without Gearing. All have **Long Spiral Steel Springs** giving them **Double the Capacity of any other Wringer and Greater Durability.**

F. F. ADAMS & CO.,

ERIE, PA.,

CHAS. D. & W. S. GRAHAM,

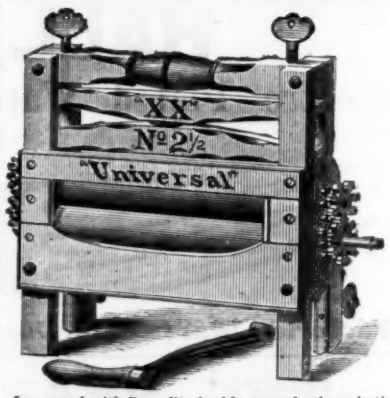
No. 88 Wall Street, New York,

AGENTS.

No. 10, - - - - - $57.00 per dozen.

THE "OLD RELIABLE"

UNIVERSAL WRINGER.



Improved with Rowell's double cog-wheels on both ends of each roll.

OVER 500,000 SOLD!

And now in use, giving "Universal" satisfaction. EVERY WRINGER WARRANTED.

Sold by dealers generally.

METROPOLITAN WASHING MACHINE CO.,

32 Cortlandt St., New York.

1865. THE PEERLESS CLOTHES WRINGER. 1877.

No Deviation from Regular Rates.

No. 2, $66·00.

White Rubber Rolls, Metal Journal Boxes, Patent Crank Fastening, Rubber Fastening Pads, Maple Wood Frames. Simple, Durable, Efficient.

No. 3, $74·00.

Wrought Iron Thumbscrews, Apron or Clothes Guard, Hickory Spring Bar and Rubber Spring. Perfect in Finish. Send for Circular

Warranted Double the Capacity of any Purchase Gear Wringer.

CLOTHES WRINGER!

Self-Adjusting Steel Elliptic Spring.

T. J. ALEXANDER, Manager,

BOSTON, MASS.

ESTABLISHED 1850.

WM. HASSALL,

Manufacturer of

American and French

Wire Nails

With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. **Brush Makers', Upholsterers', Cigar Box, Basket, Chair and Undertakers' Finishing Nails** a specialty. **Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheon Pins,** with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: *Nos. 63 & 65 Elizabeth Street, New York.*

A. F. PIKE,

East Haverhill, New Hampshire,

Manufacturer and Wholesale Dealer in

Scythe, Axe, Knife and Hacker

STONES.

LETOILE, UNION, PREMIUM, DIAMOND GRIT, WHITE MOUNTAIN INDIAN POND (red ends) Stones gotten up or labeled in any style desired. Price and quality guaranteed.

Our Stone are of good keen grit and *will not glaze.*

Practical Iron Founding.*

BY EDWARD KIRK.

V.

DAUBING THE CUPOLA.

The most important thing in the melting of iron in cupolas is the proper construction of the cupola, and the next important thing is to keep the lining in proper shape. I have shown in Figure 13 what is the proper shape —which is a slight projection over each tuyere to prevent the iron from dropping into the tuyere, and a hollow in the lining or increased diameter of the cupola just above the tuyeres. This hollow place in the lining may be a little higher than I have shown in this illustration, as explained under the head of "The Melting Point;" but in putting in a new lining it is not necessary to form this hollow in the lining, for the heat will soon cut it out at the melting point; and in daubing and making up the cupola for a heat the lining should always be left slightly hollow at this point, as shown in Figure 13. Some melters, who do not thoroughly understand their business, think that, when the lining burns out hollow at the melting point, they must make it up straight with daubing, or the lining will burn through and the iron will run out through the caisson; and they will daub on a belt of mud 2 or 3 inches thick all around the cupola, as shown in the sectional view of a cupola (Figure 14). This belt of mud is not only made flush with the lining, but it projects out further than the lining, and by it the diameter of the cupola is decreased at the point where it should be the largest. The daubing for cupolas is generally made of common clay, mixed with a little fire-sand or sharp-sand. This daubing will not resist like fire-brick or fire-clay, and the heat is more intense at this point than at any other in the cupola; and this daubing, if put on too thick, will melt and be converted into a cinder or slag; and this slag will run down and be chilled over the tuyeres by the cold blast, and will bung up the cupola in a short time; or this mud belt may break loose from the lining, as shown in Figure 15, which illustration represents a sectional view of the interior of a cupola that I saw at Richmond, Ind., in 1875. This cupola was about 30 or 35 inches in diameter, and the average heat melted in it was about 4 tons; the melter, in charging, used too much coke in the bed and between the charges of iron. This caused slow melting, which was very hard on the lining, and cut it out badly at the melting point; and when chipping out and making up the cupola the melter would chip out all the cinders and slag until he came to the brick, and in knocking off the cinders he would jar and crumble the face of the brick; he would then daub on a belt of mud 2 or 3 inches thick all around the cupola, as shown in Figure 14. This mud was too heavy to hang on the brick, and when it was heated slowly the moisture was all forced back against the brick lining, which moistened the mud at that point and caused it to break away from the lining; and it would then settle down in a heap over the tuyere, as shown in Figure 11; but when it was heated rapidly the heat would bake the outside of it and prevent it from squatting down in a heap. The moisture in the mud was converted into steam, and was forced back against the brick, where it would be partially condensed; and the water would soften the mud and the steam would force it off from the lining at the top, and the fuel and iron would get down behind the mud and force it down into the cupola, so as to bridge it over above the tuyeres. One day, while I was at this foundry, the cupola melted very slowly, and when the heat was about half off, the iron began to run out at one tuyere, and no iron at all could be gotten out at the tap-hole. The cupola continued to melt in this way for a short time and then stopped altogether, and the bottom was dropped. On examining this cupola the next morning, I found it to be in the shape shown in Figure 15. The belt of mud had broken loose at the top from the brick lining, and the fuel and iron had gotten down behind it and forced it down into the cupola, so that it formed a complete bridge over it just above the tuyeres, with only a small opening in the center. All the fuel around this opening had been consumed, and the iron came down and lodged on this bridge of mud; and it was here struck by the cold blast and the melting stopped. On the one side the bottom of this mud belt still hung to the lining, but on the other side it had broken loose altogether, and had sunk down below the top of the tuyere; and on this side some little iron had been melted above the mud bridge, and came down and run out at the tuyere. The melter always had trouble in dumping his cupola, and he generally had to poke and pry at it with a bar for one or two hours every heat before he could get it down, and sometimes he would have to work at it until 8 or 9 o'clock at night. All his trouble was caused by too much daubing. The lining would be cut in holes every heat, and the melter had to put in a few brick after each heat. All these holes that were cut in the lining were caused by using too much daubing, and the daubing breaking loose from the lining and settling down in such a shape as to throw the blast and heat against the lining in spots, instead of having an equal heat all around.

This cupola had to have about 2 or 3 feet of new lining put in, just above the tuyeres, every two weeks, and the melter, to protect this new lining, would always daub an inch or two of mud upon it; this mud, instead of protecting the lining, was the cause of its burning out, for it would break loose from the new lining and settle down so as to prevent the free working of the cupola and concentrate the heat upon the lining and melt it down instead of melting the iron. The melter in this foundry had made the proprietor believe that the cupola was too small to melt 4 tons of iron, and that it was worn out, which was the cause of all his trouble with it, when really the whole trouble was that the melter did not understand his business, and his ignorance was costing him a great deal of extra labor, and costing the foundry company $5 or more every day for extra fuel, fire-brick and clay. Yet the lining of a cupola will be burnt out at the melting point a little every heat, and if the melter does not replace it, it will burn through to the caisson, and the iron will run out through it. To prevent this the melter must have recourse to daubing, but he should be careful not to use too much or too little daubing, and he should keep between the two extremes, and to do this he should not daub on more than a half inch or an inch of daubing at any one place, and if this amount of daubing will not keep up the lining, it cannot be kept up by putting on more than that amount; for after he gets beyond that amount the daubing is too heavy to hang on to the lining, and it breaks loose and does more harm than good; even one inch of daubing is too much to put on all around the cupola. When chipping out the cupola the melter should not chip out all the cinder until he comes to the fire-brick, but he should merely chip out enough to get the cupola in proper shape; for this cinder has been oxidized by the heat, and in many cases it will stand the fire better than the new daubing. If a cupola cannot be kept up by putting on a small amount of daubing, then there is something wrong, and the melter should at once find out what the trouble is, which may be in his manner of charging in the tuyeres or in the blast; for if the iron is charged high in the center it will throw all the fuel to the outside, and will cut the lining worse than when charged level; and if the stock is charged uneven, it may be the cause of cutting out the lining in holes; if the blast is too sharp and cutting, it will be hard on the lining; if the tuyeres are not put in at regular distances apart, they may cut the lining badly by throwing the blast and heat against the lining in spots. When the melter finds his lining hard to keep up he should regulate his mode of charging; if that does not do any good, then he should vary the blast; if that does no good, then he should change the shape, size or place of the tuyeres.

Fig. 14.

CUPOLA IMPROPERLY "DAUBED."

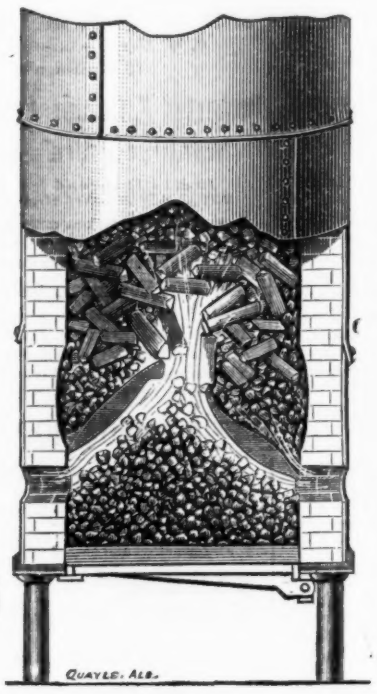


Fig. 15.

THE EFFECT OF "IMPROPER DAUBING."

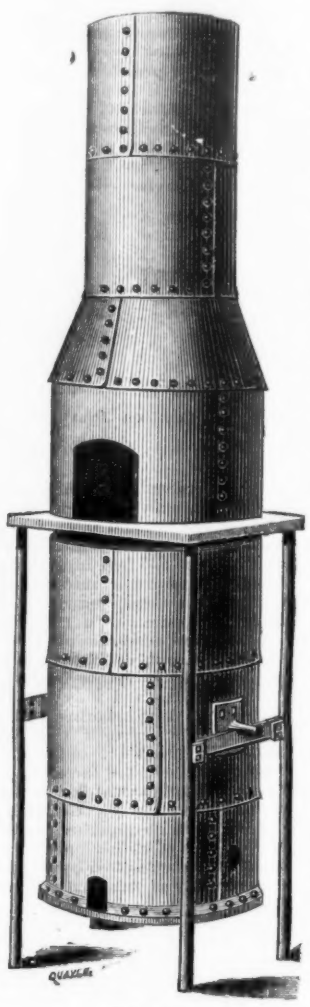


Fig. 16.

SWIVEL CUPOLA.

SWIVEL CUPOLA.

The swivel cupola, Fig. 16, is a very handy little cupola for small work, and is in use in a great many small foundries. In constructing this cupola, four iron columns are used to support the stack, which is set upon an iron plate on top of the columns. The stack may be made of boiler plate and lined with fire brick, as shown in Fig. 16, or it may be built of common brick; two cross-bars are bolted on to the columns, and the cupola is hung on two swivels, which rest on the cross-bars; the top of the cupola does not touch the plate upon which the stack stands, but is 2 or 3 inches below it, or low enough to allow the cupola to be turned over without striking the plate. This cupola may have a drop bottom or a stationary bottom with a brick hearth. When the bottom is stationary the refuse may be drawn out at the front, or the cupola may be turned upside down and dumped. When the cupola is only 15 inches or less in diameter the stationary bottom is the best, but when the cupola is over 15 inches in diameter the drop bottom is to be preferred. When the drop bottom is used for this cupola, it should be supported by a latch or cross-bar and not by a prop, for the cupola may be rocked a little when charging the stock, and the prop will give way. The swivels or bearings should be bolted on to the cupola a little below the center, so as to have the cupola as nearly balanced as possible when the iron bottom is on, so that the cupola will be easy to turn on the swivels. This cupola may be turned over by hand or by gear wheels attached to the swivels. When the cupola is large, or where it is desirable to dump the refuse by turning the cupola upside down when hot, the gear wheels should be used. As only a small amount of iron is melted in the cupola at a time, a 2-inch lining is heavy enough for it. When picking out and making up the cupola for a heat, it may be laid over on its side and picked out with a long bar to avoid going into it. When it is desirable to melt more iron than the cupola is capable of melting, it may be run until bunged up and then turned over and dumped, and picked out with a long bar while hot, and then turned up and fresh stock put in and the heat continued. This style of cupola should not be made more than 20 inches in diameter and 6 or 7 feet high, as it would be too heavy to handle when lined. The swivel cupola is a very handy and convenient little one for melting small quantities of iron, and for mixing irons to test their quality, and no large foundry should be without one. Most of our large foundrymen have no small cupolas in their foundries, and when introducing new brands of iron they have to test their qualities in the large cupolas and through an entire heat, and in this way whole heats of castings are often lost, which loss might have been avoided by having a small swivel cupola and testing the quality of the iron on a small scale before introducing it into the large cupola or through the entire heat.

THE SAND BOTTOM.

Sand gathered from the gangway is generally used for the bottom; a little new sand is sometimes added to give it more strength. All new sand, sharp or fire-sand, should never be used for the bottom (especially in small cupolas), for it will bake in too hard and not drop easily. Some melters prefer to gather the old bottom out of the pit and add a little new sand to it, and put it in again. This makes a very good bottom, as the sand from the old bottom will contain small particles of cinder, which will make it open and porous, and prevent it from baking in hard, and make it drop easily. The old bottom should always be put into a small cupola in preference to sand from the gangway; the sand bottom should be put in so as to be high around the outside and have a gradual slope toward the center and front. Care must be taken to not give it too much slope, as it will throw the iron out with too much force when tapped; care must also be taken to not get the bottom too flat, or the iron will not run out and will chill on the bottom and make dull iron. The thickness of the sand bottom will vary from 2 to 10 inches, according to the size of the cupola. If the sand bottom is too wet, it will make the first iron hard; if it is not rammed even and packed solid around the edges, it may allow the iron to run out; if it is rammed too hard, the molten iron will not lay upon it, but will boil and cut up the sand and make a dirty iron, and it may cut through the sand and run out through the iron bottom.

FRONT OR BREAST.

The front should be put in with sand or loam that will not bake in too hard, and will not cut nor crumble when the iron strikes it. A little fire-clay is sometimes used in the bottom of the spout and around the tapping hole to prevent the tapping hole from cutting out and getting too large. The front should not be more than 1½ inch thick at the tapping hole, or the iron will be liable to chill in the tapping hole between taps. When the lining of the cupola is very thick, the brick should be cut away around the front on the inside, so as not to have the sand front too thick. Some melters put in their front before the fire is lit; this answers very well when the cupola is large and the tuyeres are low down, but it will not do in a small cupola with high tuyeres. Coke melters build up a wall of coke in front of the fire and ram the sand against it; this makes a very good front. Some coal melters cut a piece of board the proper size, with a notch in the bottom of it, and set the board back against the hot coals and ram the sand against the board; this makes a very nice front, for the board soon burns out and dries the front, and leaves it straight and even on the inside. Most melters ram the sand back against the hot coals, and pay no attention to the inside of the front; this should never be done, for the front will be rough and uneven on the inside, and will cut and crumble with the heat and iron. This way of putting in the front is often the cause of dirty iron and of slag running out at the tapping hole.

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INDUSTRIAL ITEMS.

CONNECTICUT.

The business of The Pratt and Whitney Co., Hartford, for 1877, will amount to $375,000. This is 40 per cent. more than 1876, only 20 per cent. less than 1872, and exceeding every other year except 1874 and 1875, when contracts with the Royal Small Arms Department of Berlin, Prussia, were executed, and machinery was delivered to other parties at home and abroad to the aggregate amount, for the two years, of $1,100,000. Only one-fourth of their business for 1877 has been with foreign parties. Among the new articles manufactured by the company are 9 and 12 inch combination lathe chucks, A. F. Cushman's patent; cutters for cutting the teeth of gear wheels, steam traps for returning condensation from drying pipes, cylinders, &c., and feeding boilers; taps with U. S. standard, Whitworth standard, and sharp V threads for machinists; screw plates for jewelers, machinists and blacksmiths, which cut clean full threads in once passing over a bolt, sizes ranging from 3-32 to 1½ inch, in plates numbered 0, 1, 2, 3 and 4; machines for heading screws and small bolt blanks from the coil of wire.

The Colt's Company are giving their 500 hands eight hours. They have sold more Baxter steam engines during the last two months than at any similar period for several years. They have just received an order for 300,000 horse shoes, drop-forged. These are made of iron with calks of steel. They are getting up tools for the manufacture of the Wardwell sewing machine, and for a new double-barrel fowling piece.

P. Jewell & Sons, of Hartford, are furnishing the leather belting for the manufactory of munitions of war which the Turk is now about to establish on his own soil. This order includes a large double belt, 30 inches wide, for the main belt. P. Jewell & Sons took the first premium on leather belting at the recent Berlin Exhibition.

A Bridgeport man has invented machinery for making band-saw blades, which have hitherto been largely made by hand in Germany.

VERMONT.

Work is being rapidly pushed forward on the new Howe Scale Works buildings at Rutland, over 100 men being at work. The foundation of the foundry is nearly finished, and over 250 car loads of "underpinning" have already been used.

NEW HAMPSHIRE.

The Nashua Novelty Works, which manufacture bird cages, toys, &c., are running until 10 o'clock every night.

MASSACHUSETTS.

The Lowell Machine Shop sent 29 car loads of machinery to the Natchez Cotton Mills, Natchez, Miss., recently. The machine shop is to furnish machinery and fixtures for a mill of 4000 spindles.

The Richmond Iron Company's furnace at Richmond, is the only iron furnace in blast in the State, now that the Colby Works in Lanesboro are shut down.

NEW YORK.

The Fort Plain Spring and Axle Works, Wood, Smith & Co., Fort Plain, are very busy on orders, and have been throughout the entire year. Their foreign trade has been increasing, and is, we believe, larger now than at any previous time. The increase in the domestic trade has compelled them to add to the capacity of their works. They are now able to turn out 175 sets axles and 125 gross springs per day. Besides having a pretty general distribution all over the United States, the company find markets in Canada, Australia and the Sandwich Islands.

PENNSYLVANIA.

The foundation of Messrs. Eckerts' furnace has been laid, and its location is at their Henry Clay furnace.

Last Monday repairs were commenced at Bushong's Moselem furnace. A new bosh and a new in-wall, or lining, will be put in this furnace.

The foundry of Shaw, Waddington & Co., Newcastle, is now engaged on repair work for flour and saw mills.

The rolling mill of Messrs. Reis, Brown & Berger, Newcastle, is now the only establishment of the kind in the Shenango Valley which is not in operation. The stacks of their Rosena and Sophia furnaces have been roofed under. This would seem to imply that they would not be blown in this winter.

Crowther Furnace, Newcastle, which has a bosh of 15½ feet, made the very large yield in the 7 days ending with Saturday, the 27th ult., of 409 tons of pig iron.

The Newcastle Manufacturing Company is getting ready to ship the large blowing engine which they have just completed for a furnace at Moxahala, Perry county, O. The blowing cylinder of this engine is 72x48 inches and the steam cylinder 32x48 inches.

Messrs. White & Son, proprietors of the new gas pipe works, Newcastle, having made an assignment for the benefit of their creditors, the establishment is now at a standstill. The liabilities of the firm are said to be only $6,000, and a satisfactory arrangement may be made which will again set it in operation.

The Hubbard Mill started up Monday, the 29th ult., with good prospects for a long run.

The puddle mill of the Glendower Iron Works, Danville, started on Tuesday, the 30th ult.

The Co-operative Iron and Steel Works, Danville, are running along steadily. They expected to light up the new heating furnace on Monday, the 5th inst.

Van Alen & Co. have about 120 employes at their Northumberland nail mill.

Mt. Hope Furnace, that averaged for the past 100 years about 18 tons of iron per week, reports for her last week's work 75 tons. Monocacy Furnace reports 202 tons. North Cornwall reports 247 tons. Henry Clay, a 12-feet stack, 160 tons. These yields may look to be large compared with the work of a few years age, but modern improvements are telling, and the next coming 5 years will perhaps double the present work.—*Reading Times and Dispatch.*

The Weimer Machine Works at Lebanon have received an order for 30 Birkenbine fire hydrants to go West.

The Reading Company are cleaning up the Port Carbon Iron Works, and rumor says are trying to lease the Palo Alto Rolling Mill.

Messrs. Wm. Cramp & Sons, of Philadelphia, have just closed a contract with the Pacific Coast Navigation Co. for a large steamer for service between San Francisco and Portland, Oregon. The steamer is to be first class in every respect, and will be built with a special view to speed. The dimensions will be 300 feet length, 36.6 beam, 28 hold, and 1800 indicated horse-power, and is expected to develop a speed of at least 15 knots an hour. The same firm are also building a large and powerful tug for service on the Delaware.

We take the following item from the *Reading Eagle*: From a number of sources it is learned that the iron trade of the Schuylkill valley shows considerable improvement as compared with the business of a corresponding period last year. The Henry Clay Furnaces, this city, have orders now which will keep them busy far into the spring months of 1878, and the remaining furnaces in this section show considerable life. Henry S. Eckert's opinion of the outlook of the trade is encouraging, and the reasons for this are that a large quantity of the iron that was in stock has found a market, and that there is now an increase in the demand for iron which must be made. In the race to supply the iron needed there is considerable competition, and the furnace men of the Lehigh Valley are leaving nothing undone to gain control of the trade by supplying the market at very low prices. The furnaces in blast in this section are those of the Messrs. Brooke, at Birdsboro; the Henry Clay, Seyfert, McManus & Co.; the Keystone of the Messrs. Bushong, Leesport, Robesonia, two at Sheridan and several along the East Penn road. The nail factories and rolling mills, forges and rail and plate mills, and other iron manufacturing establishments in Reading, are moving ahead in a promising manner, and the outlook in the iron country generally in Eastern Pennsylvania presents a ray of hope that is calculated to give increased confidence. The Reading sheet mill is still idle, and there is no telling when it will start. In this connection the experience of Benjamin Haywood, an experienced iron man of Pottsville, may be of value. The rail mill owned by him is idle, and has been for about three years. Before the mill shut down, however, Mr. Haywood had all his material worked up, and when the mill closed he had about 75,000 tons of new rails. Previous to the suspension of work at this mill, the proprietor requested his employes to accept a reduction of 10 per cent., which they stoutly refused. "I have disposed of all my rails, with the exception of about 18,000 tons, and am otherwise very comfortably situated, and it is no great loss to me if the mill never makes another rail. If my men had acted wisely the mill would have probably been running to-day, and they would have work. But never in my life have I known or heard of a strike that has been a benefit to the strikers." The Pottsville rolling mill, Atkins & Bros., proprietors, is running about two-thirds time. They have also, in connection with the mill, a foundry and machine shop for the manufacture of car axles and wheels. Three blast furnaces are owned by this firm, all of which are situated in the town proper, two of them being idle. They have a tolerably good number of orders on hand, but state that there is no advance in prices; are selling all the iron that they are making, and the inquiry is rapidly on the increase. This mill has a capacity of about 25,000 tons of finished rails per year.

[*Continued on page* 24.]

Steel Center Self-Sharpening Horse and Mule Shoes.

Our readers who are accustomed to drive horses in the winter, especially in northern climates, need not be told of the great necessity of sharp calks for their horses' shoes. To keep them so, in many sections, is a constant source of expense, trouble and injury to the horse's hoof, while to neglect them is dangerous both to horse and driver. Messrs. Thistlewood & Co., of Pittsburgh, Pa., are manufacturing a shoe which is self-sharpening. It is made of a thin layer of cast steel rolled between two layers of charcoal iron, as is shown in the white line in Fig. 1.

Among the advantages claimed for these shoes are the following:

1. The iron being much softer than the steel, wears away, and thereby leaves the thin, hard steel projecting, which, forming a perfect edge, remains sharp until the calk is entirely worn down, thus saving sharpening and a consequent large amount of expense to the consumer.

2. The use of these shoes prevents the destruction of the horse's hoof, which often occurs from too frequent nailing. They are also of decided advantage to the blacksmith or horse shoer, as they entirely dispense with the old process of steel heeling by hand, which is disliked by all shoers.

Fig. 1.—This Cut represents a Heel Calk taken from one of Thistlewood & Co.'s Patent Steel Center Self-Sharpening Shoes, after being worn all winter.

Fig. 2.—This Cut represents a Heel Calk taken from a Common Iron Shoe, worn during the same time.

3. The steel being laid between the upper and under surfaces, and extending entirely around the shoe, the nails must necessarily pass through the steel, which, being harder than iron, prevents the nail holes from wearing.

4. The steel, having no grain or seam, obviates the splitting of the crease.

5. It very much stiffens the shoe without any liability of breaking.

The superior durability of the self-sharpening shoe is shown in the accompanying engraving.

Some Notes on Water Pressure Machinery.

Sir W. G. Armstrong, in addition to his inventions in guns, has devoted much time and attention, to the subject of hydraulic motors or water pressure engines. These are distinguished from turbines and similar water wheels by the employment of a cylinder and reciprocating pistons. In a short historical sketch read by him not long since, at a scientific meeting in England, he gave a very interesting account of the modern development of water pressure machinery. His attention was first called to the subject of water pressure as a motive power by noticing the waste of power exhibited by mountain rills in the Craven district of Yorkshire. He was thus led to devise a water pressure engine which combined the use of pistons with the continuous rotation of a water wheel. A large working model of this wheel was tried in 1839, by connecting it with the street water pipes in Newcastle, when it gave a high co-efficient of effect. About the same time he pointed out that a stream of rapid descent might generally be conveyed in a nearly level cut along one of its banks, until it attained a great elevation above the valley, and until a point was reached where the fall could be rendered available by a pipe of moderate length. Also, that there are many precipitous streams which were capable of furnishing a surprising amount of power, especially if combined with flood-water reservoirs to equalize the supply. He likewise argued that the water supplied to towns for domestic purposes could, in many cases, be advantageously employed for working all kinds of machines. He showed that it would be more economical to use water for hoisting a given weight of merchandise than hand labor, and that it would result in greater expedition. The principle, too, was enunciated that, when the water was lifted by a pumping engine it became the recipient of the power exerted in raising it, and that if the same water were used as a motive power in descending to its original level, it would render back the power conferred upon it by the engine; so that the power of the pumping engine might be transmitted to a distance and distributed in large or small quantities as required. A crane was then designed, in which the lifting was performed by a single stroke of a piston, multiplied by folding the chain over sheaves in the inverted order of pulley tackle, the slewing motion of the jib being effected by a separate cylinder, the piston of which was attached to a rack working into a circle of teeth at the base of the crane. By a suitable valve the water was admitted into the lifting cylinder, when the weight on the chain was to be raised, and suffered to escape when the weight was to be lowered. To avoid dangerous jerks by the sudden closing of the outlet when the weight was being rapidly lowered, a small clack valve was applied, opening upward against the pressure in the supply pipe, so as to permit the pent up water in the cylinder to be pressed back in the supply pipe, whenever the compression in the cylinder exceeded the pressure of the water in the pipe. The slewing cylinder was also fitted with an appropriate valve for admitting the water to either side of the piston, while it allowed an escape from the opposite side. Relief valves were likewise applied at each end of the slewing cylinder, to save the machinery from being broken or strained by the momentum of the jib when the regulating valve was suddenly closed. In 1846 a crane on this principle was erected at Newcastle, and speedily attracted the attention of engineers.

The late Mr. Jesse Hartley was induced to order cranes and hoists for a portion of the Albert Dock, Liverpool, to be worked by the pressure from the town water-pipes. These machines, when first erected, answered perfectly; but the pressure of water soon became so variable that the extension of the system was considerably checked, until the alternative method of employing a steam engine to generate the pressure, was introduced. Hydraulic cranes for railway stations were first adopted in 1848 by Mr. Harrison, ex-president of the Institute of Civil Engineers. Up to 1849, all the cranes and hoists which had been erected derived their power from town reservoirs; but about that time the author substituted an air vessel for an elevated tank. In 1849, the late r. Rendel consulted the author as to employing hydraulic pressure at the Grimsby docks, not only for working cranes, but also for opening and closing the dock gates and sluices. To obtain the necessary pressure a tower 200 feet in hight was erected, to carry a reservoir into which water was pumped by a steam-engine. The machinery came into operation in 1851. In 1850, Mr. Fowler, ex-president of the Institute of Civil Engineers, decided to apply hydraulic pressure for the cranes in the freight sheds of the New Holland Ferry Station, and also for raising and lowering two platforms to communicate between the railway and a floating landing stage on the river. As local conditions prevented the erection of a water-tower, the author was led to the idea of the present accumulator. Until 1849, the author had met with no opportunity of realizing his original idea of utilizing mountain rills; but he was then consulted by Mr. Sopwith as to the propriety of substituting water-pressure engines for over-shot water-wheels at Allenheads. The water was collected in reservoirs at elevations of 200 feet, and all the purposes to be served required rotative motion. Reciprocating engines were, for various reasons, adopted. Each engine had two cylinders placed at an angle of 90 degrees to each other, and working upon the same crank-pin. Balanced cylindrical valves were used, and the passages were large, to keep down the velocity of the water. Relief valves were applied to prevent shock at the end of the stroke. An extension of hydraulic machinery, involving the use of accumulators, was made later in the vicinity of Allenheads. In 1851, the late Mr. Brunel proposed the application of hydraulic pressure to turntables, transfer tables, and hauling capstans, and an extensive plant of such machinery was erected at the Paddington station of the Great Western Railway. By the end of 1851, the principle of transmitting and distributing the power of a steam engine through the medium of water stored in an accumulator, had become thoroughly established. The original idea of utilizing mountain torrents, which was the progenitor of the accumulator system, had only been partially realized; but although the cascades and rapids in many unfrequented districts were still generally neglected as sources of motive power, and might continue to be so while coal was plentiful and mountain valleys remained difficult of access, yet it could hardly be doubted that the descent of water from elevated land was destined at some future day to become an important source of motive power. The transmission of the power might be facilitated by employing the prime moving column to pump water into accumulators, and by conveying the water under high pressure in a comparatively small pipe to situations where its value would be appreciated. The engine required would be a mere intensifier of pressure, and would be of the simplest description, consisting mainly of a press-ram and a pump-ram, in direct connection with each other, and having their areas proportioned to the acting pressure on the one side and the resisting pressure on the other. Even falls of small hight, sufficient only for water wheels and turbines, could be employed for giving a high pressure to water for the purpose of transmission, and this had actually been done near Allenheads; and it had lately been proposed to utilize, in a similar manner, the first cataracts of the Nile. The author then proceeded to describe the various forms of water pressure machines which had come into use under the heads of hydraulic engines, hydraulic cranes, movable cranes, movable jiggers, hydraulic hoists, coal discharging apparatus, coal loading machinery, hydraulic machines for docking ships, sluice machines, swing-bridge machinery, drawbridge machinery, hydraulic applications to gunnery, and corn warehousing machinery. He explained the modifications and improvements which had been progressively made, and showed the state of development at which water pressure machinery had arrived.

Two Disastrous Colliery Explosions.—Two great disasters have been added to the long and dark record of British coal mining accidents. The first, on the 11th of October, happened at the King's Pit, Pemberton, near Wigan, in the 9-foot seam, 300 yards below the surface, though the general arrangements of the mine seem to have been excellent. The dead and the missing number 37, of whom three, the manager and two assistants, died in a heroic attempt to save the lives of those buried. When it was found hopeless to attempt further rescue of life, the efforts were directed toward extinguishing the flames which had broken forth. The second catastrophe was the most terrible in the history of Scotch mining, as it is reckoned that fully 200 lives were lost. It took place in the Glasgow region, at the little colliery village of High Blantyre, near Hamilton. The rare occurrence and the trivial nature of accidents from fire-damp in the Hamilton district, had engendered so great a confidence that naked lights as well as day lamps have been in regular use.

Special Notices.

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Dealers Exclusively in American Hardware.

Manufacturers who wish to have their goods introduced in Germany, please correspond.

Attention.

Dealers in Hardware, Iron and Steel, Coach Makers' and Blacksmiths' Supplies and general Machinery will find it greatly to their interests to write for descriptive circular and discounts of the Improved "Eclipse" Fan Blower, for home and export trade. Is cheaper, better and more durable than the bellows; requires only 12x20 inches floor space. See cut and description in *The Iron Age* of May 17, 1877.
Address EZRA F. LANDIS, Lancaster, Pa.

CHARLES OTTO,
P. O. Box - - - 1199.
(ESTABLISHED 1854.)
Importer & Dealer in HARDWARE,
Manufacturers' Agent, etc
12 & 14 Front and 250 & 252 Market St., } *San Francisco*

I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

REFERENCES:
Sargent & Co., 37 Chambers Street, New York.
Van Wagoner & Williams, 82 Beekman St., N. Y
T. Hessenbruch & Co., 10 N. 5th St., Philadelphi
The Pennsylvania Tack Works, Norristown, Pa.
The Pacific Bank, San Francisco.

Paris Exposition of 1878.

C. W. MAY, FIRNHABER & CO, Commission Merchants,
50 Boulevard Haussmann, Paris,
Agents for American Exhibitors.
For information and blanks apply to A. W. MORTON, 22 Platt St., New York.
Application for space may now be made.

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of
Iron and Steel Drop Forgings
in quantities to order at reasonable rates.
HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

To Rent,
The Works of the Chicago Plate and Bar Mill Co.

Large trade established. Works ready to start; prepared to manufacture all sizes and qualities Fancy Boiler Plates and Sheets. River frontage and tracks into yard for fuel supply. Nicholson pavement to the gate to facilitate delivery. Only works West of Pittsburgh. Call, or address
CHARLES DOWST,
248 Clark St, Chicago, Ill.

Important to Manufacturers.
BISSELL, WELLES & MILLET,
Auctioneers and Commission Merchants, No. 15 Murray St., New York,
Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

Manufacturers
desiring to open a trade with the Cape of Good Hope (South Africa), through one of the foremost houses in that colony, are invited to communicate with "CAPE,"
Office of *The Iron Age*, 83 Reade Street, N. Y.

HARDWARE MERCANTILE AGENCY
Report Just Published.
Better than all the general Mercantile Agencies for HARDWARE, IRON, STEEL, GUNS and AGRICULTURAL IMPLEMENTS. $25 a year.
WM. P. CLEARY,
P. O. Box 1790. *76 Chambers St., N. Y.*
WANTED.—Men of undoubted ability and character to solicit subscriptions.

For Sale.
TO ARRIVE.
100 tons best blacksmith or forging coal. Delivered in two weeks in New York, below 13th street, or in Jersey City or Hoboken. Address **COAL,**
Office of *The Iron Age*, 83 Reade St., N. Y.

Special Notices.

The Sherman Process Company,
PROPRIETORS OF THE
"SHERMAN" PATENTS,
Is now ready to
Issue Licenses to use the said Process under a Royalty.

The Process is used to great profit in the Puddling Furnace, Martin-Siemens Furnace, Bessemer Converter, Crucible, and for Gray Iron Castings.

The use of the Process does not involve any changes in the furnaces or in the present manner of working them, nor does it increase the labor, but on the contrary saves material, fuel, labor and time.

The chemicals used are not expensive, their cost not exceeding 25 cents per ton of product, and the charge for royalty is placed at a low price so as to bring the Process into general use.

By the use of this Process a large percentage of the cheaper grades of irons and steels can be made into a good merchantable product.

Irons which have been found impossible to use either alone or in mixture with other irons are now being profitably used by means of this Process.

It improves the working of both poor and good irons or steels, a better product being obtained by its use than is possible without it. It makes the molten metal more fluid and the product more sound, homogeneous and ductile.

It makes less skull and scrap and less waste in the finished product.

It greatly improves sulphurous and phosphorus irons and steels, making them less red and cold short, and produces a more even product.

For castings that are to be tapped and have threads cut upon them, it allows a close, strong iron to be used, leaving it soft for the tool to readily cut.

By the use of this Process in the Bessemer or Martin-Siemens furnace, good steel rails can be made from a mixture of from 30 to 60 of old iron rails and the balance good stock. Thousands of tons of steel rails made by this Process, as above, are now being used in France.

The Process will be demonstrated without expense, at the works of parties applying, and the amount of royalty to be charged for its use will be furnished upon application to
The Sherman Process Co.,
No. 9 Pemberton Square,
BOSTON, MASS.
See page 17 of *The Iron Age*, of Oct. 25, 1877.

PARTNER WANTED.

An experienced business man, with from $10,000 to $15,000 capital of his own, and who can show good antecedents, can obtain a desirable interest in an old-established Hardware and Agricultural Implement business at one of the very best points at the West for jobbing. Business now in fine condition. A good hardware man preferred. All communications confidential. Address **W.,**
Office of *The Iron Age*, 83 Reade St., N. Y.

Wanted,
A first-class, practical Boiler Maker.
References required. Address
E. M. BIRDSALL & CO.,
Penn Yan, Yates Co., N. Y.

SPECIAL NOTICE.

The undersigned, in view of the **Paris Exhibition** of 1878, begs to inform his friends that he continues to make translations of Catalogues, Prices-current, Circulars, Correspondence, &c., from and into the
ENGLISH, FRENCH, GERMAN and SPANISH,
and that he bestows special attention upon a strictly correct rendering of **Technical Expressions** in matters relating to **Machinery, Metallurgy, Hydraulics,** &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of catalogues, &c., in the above languages. **C. KIRCHHOFF,**
Metal Reporter of The Iron Age,
83 Reade St., New York.

PAY ROYALTY
and build the
Improved "Cahoon" Broadcast Seeders.

I have patented very valuable improvements on the CAHOON machine, and desire to arrange with responsible parties to manufacture them, paying me royalty. A large business can be done applying the improvements to Cahoon machines already in the hands of farmers, not five per cent. of whom are probably satisfied with it. I know, as a practical farmer, that they can be WARRANTED with my improvements, and I will warrant 100 to test the matter. Address **J. PEARCE,**
Box 254, Shelbyville, Kentucky.

TO LET,
A Light, Handsome Office.
Possession Immediately.
HERMANN BOKER & CO., 101 Duane Street, N. Y.

New & Second Hand Machinery & Tools
One 30 in.x6 ft. Pond planer; one 21 in.x6 ft. Ferriss & Miles, do.; three 16 in.x3 ft. Pratt & Whitney, do.; one 15 in.x3 ft. New Haven, do.; twelve Pratt & Whitney milling machines; two extra heavy milling machines; one double head, do., Wood, Light & Co., makers; three bolt cutters, Wm. Sellers & Co., makers; one heavy chucking lathe; one 14 in. Putnam Shaper; one 8 in. N. Y. S. E. Co., do.; one heavy shear, cuts 2½ in.x4 in. iron; one 700 lb. steam hammer; one 1200 lb. do.; six 16 in.x8 ft. lathes; six 14 in.x6 ft., do.; two heavy upright drills; two Merrill Drops, 600 and 1000 lbs. hammers; thirty spinning lathes, 12 in. swing, 4 and 5 ft. beds. Lot small engines and other machinery.
The Bullard Machine Co., Limited,
14 Dey Street, New York.

A GENTLEMAN HAVING A FOUR YEARS' experience in the agricultural implement trade on the continent, desires to make an engagement in a similar line, or in machinery or manufactures.
Has a first-class acquaintance in Germany, Austria, Belgium, Holland, Sweden, France and Russia.
Best of references given. Address
P. O. Box 972, Auburn, N. Y.

Inventors
of articles in Builders' Hardware desiring to dispose of same by sale or on royalty, on reasonable terms, may address IRONMONGER,
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

Wanted.—A Partner,

with a capital of $25,000 dollars, to build and equip a Narrow Gauge Railroad, of 4¾ miles, from Altoona Coal Mines to the A. M. & O. R. R. The road has been surveyed and partially graded. The subscriber owns 9000 acres of land, lying in Pulaski county, Va. Upon the property are two seams of coal, which have been fully developed by tunnels, one of 32 inches of solid coals very nearly approaching anthracite, and one of 22 feet of soft coal. A shaft has been put down 45 feet on this seam. The coal improved very much in hardness. The coal has been tested by Mr. J. E. Woolten, Gen. Manager Pa. & Reading R. R., and found to be adapted for locomotive purposes by using the improved grate bars. The coal from the 32 inch seam has been tested on the locomotives of the A. M. & O. R. R., and is the *only coal* along the line that can be used in the company's locomotives.
Market price of coal $5.00 per ton on the cars.
Address *D. RICHARDS & CO.,*
Prop. of Rolling Mills, *Lynchburg, Va.*
Or *WM. T. HART, C. E.,*
Martins Station, Va.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,
IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

NOVEMBER LIST.

MACHINE TOOLS,
Second-Hand.

Three No. 2, Pratt & Whitney Screw Machines, with wire feed.
One No. 1, Pratt & Whitney Screw Machine, with wire feed.
Two "Belden" Screw Machines.
One Brainerd Index Milling Machine.
One No. 3, Geared Stiles Press.
One No. 4, Geared Stiles Press.
Two Engine Lathes, 13 in. swing, 6 ft. bed.
Two Engine Lathes, 22 in. swing, 8 ft. bed.
One Engine Lathe, 76 in. swing, 36 ft. bed.
One Planer, planes 70 in. wide, 52 in. high, 27 ft. long.
One Pratt & Whitney Lathe, 13 in. swing, 5 ft. bed, with taper attachment. One Engine Lathe, 15 in. swing, 6 ft. bed. One Engine Lathe, 15 in. swing, 7 ft. bed. One Engine Lathe, 18 in. swing, 8 ft. bed. One Engine Lathe, 22 in. swing, 16 ft. bed. One 21 in. swing Upright Drill. Three 4-spindle Drills. Four common Milling Machines. One Brown & Sharpe Universal Milling Machine. One 36x36x9 ft. Planer. One 8 in. Shaper. One Gear Cutter. One 2-spindle Profiling Machine. One No. 1 Bliss & Williams Press. One "Bement" No. 2 Cotter and Key Seat Drill. One new "Hardaway" Bolt Heading Machine, to head up to ⅞ in. bolts. One new "Hardaway" Bolt Heading Machine to head up to 1⅛ inch bolts. One "Merriman" Bolt Cutter, to cut up to 1½ in. bolts. One "Davy Bros." 1200 lb. Steam Hammer. One "Ferris & Miles" 2000 lb. Steam Hammer.
Please specify which of the above tools you want and we will forward all particulars.
The above tools will be sold very low, and can be seen at
The George Place Machinery Agency,
121 Chambers and 103 Reade Sts., N. Y.

Wanted,
A CAM POWER PRESS.
Size of bed must be 15x20 inches. Address
PRESS,
Office of *The Iron Age*, 83 Reade St., N. Y.

Lamberson's
HARDWARE PRICE BOOK.
Half leather, $10; full leather, $12; full Russia, $14.
Send for descriptive circular.
DISCOUNT LISTS.
Screws..... 75c. Cast Butts..... 75c.
Bolts..... 75c. Wrot. Butts & Hinges, 75c.
BUELL LAMBERSON, 97 Chambers St., N. Y

1000 Pounds
No. 13 Annealed Bessemer Steel Wire,
in good condition, for sale at 5 cents per pound.
F. A. HULL,
Danbury, Conn.

To Manufacturers and Patentees.
A reliable, energetic business man, about emigrating to the Australian Colonies, would like to make arrangements with parties for the introduction of their goods into that market. Address
T. G. LESLIE.,
Care of Richard Meares & Co., 307 and 309 Sixth avenue, New York.

TRUSTEE'S SALE.
The property formerly belonging to the Peekskill Iron Company, consisting of a Furnace in good repair, Mines, Railroad, Engine, Rolling Stock, &c., will be sold, at public auction without reserve, at the furnace mentioned, in Peekskill, N. Y., on Saturday, Dec. 1st, 1877, at 12 o'clock noon. Terms of sale, 10 per cent. cash on day of sale; balance within 30 days and on delivery of deed. [Signed]
LEWIS C. CLARK, Trustee.

An Engineer and Machinist,
With 20 years' experience, is open for an engagement. Is competent to take charge of a public building as engineer and janitor.
Satisfactory references can be furnished.
Address **J. M.,**
Office of *The Iron Age*, 83 Reade St., New York.

SPECIAL NOTICE.
The undersigned offer their services as agents to
American Producers of Metals.
They represent foreign brands of
Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.
LOUIS WINDMULLER & ROELKER,
20 Reade Street, N. Y.

Wanted—A Partner,
In a foundry and machine business, already well established. Locality splendid and healthy.
A practical man with means is wanted to join a practical man who is already well established.
Address *CAR WHEEL FOUNDRY,*
P. O. Box 134, Selma, Alabama.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Nov. 7, 1877.

The interest in the market this week has centered mainly on the work of Congress in the matter of the currency. The Bland silver bill is the chief attraction at the close, and its passage by the House, while it is not by any means a guarantee of its final success, has the effect of unsettling gold and slightly advancing the premium. Money has been a shade higher, and the rate for call loans is 6 @ 7 per cent., while mercantile paper is quotable at 6 @ 8 per cent.

Fluctuations in gold have not been frequent or very wide, though 103 was reached for a little time yesterday. The following table shows the highest and lowest daily quotations since our last report:

	Highest.	Lowest.
Thursday	102⅞	102¾
Friday	102¾	102⅝
Saturday	102⅝	102⅝
Monday	102⅞	102⅝
Tuesday	——	——
Wednesday	102⅞	102¾

Government bonds have ruled firm with moderate operations, and no essential changes in figures. State bonds are dull, and in some cases a fraction lower. We give below the closing quotations for U. S. bonds.

In the stock market, speculation has been quite active, though transactions were interrupted by the close holiday of Tuesday. The operations to-day were generally at a slight advance over the closing rates of Monday.

FOREIGN IMPORTS.

For week ended Nov. 3:

	1875.	1876.	1877.
Total for week.	$3,310,520	$7,550,080	$5,632,816
Prev. reported..	282,848,547	237,807,236	270,935,700
Since Jan. 1....	$286,159,067	$245,357,316	$276,568,516

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils	175	$1,589
Brass goods	9	2,990
Bronzes	12	2,483
Chains and Anchors	3	230
Copper	..	14,856
Cutlery	65	22,751
Gas fixtures	4	699
Guns	22	6,047
Hardware	12	1,312
Iron, pig, tons	200	3,251
Iron, cotton ties	92	293
Iron, other, tons	552	21,520
Metal goods	100	10,936
Needles	15	7,847
Nickel	1	77
Old Metal		503
Platina	1	5,057
Per. caps	26	4,447
Saddlery	5	583
Steel	970	10,834
Silverware	4	559
Tin, bxs.	11,629	64,900
Tin, 1,606 slabs	171,778	25,551
Wire	25	2,268

EXPORTS OF SPECIE.

For week ended Nov. 3:

Total for the week	$261,657
Previously reported	23,792,106
Total since Jan. 1, 1877	$24,053,763
Same time in 1876	41,681,754
Same time in 1875	67,635,924
Same time in 1874	44,363,197
Same time in 1873	44,035,543
Same time in 1872	63,449,464

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	121½	122
U. S. 6's 1881 registered	110¼	110½
U. S. 6's 1881 coupon	110⅛	110¾
U. S. 6's 1865 new reg	105¾	106
U. S. 6's 1865 cou	105¾	106
U. S. 6's 1867 reg	108⅜	108⅝
U. S. 6's 1867 cou	108⅝	108⅞
U. S. 6's 1868 reg	110	110½
U. S. 6's 1868 cou	110⅛	110½
U. S. 10-40 reg	107¾	108
U. S. 10-40 coupon	108¼	108½
U. S. 5s 1881 registered	106⅝	106⅞
U. S. 5s 1881 coupon	106⅝	106¾
U. S. 4½s 1891 registered	105¼	105⅜
U. S. 4½s 1891 coupon	105⅛	105⅜
U. S. 4s 1907 registered	102¼	102⅜
U. S. 4s 1907 coupon	102⅜	102⅝

The latest sales and closing quotations were as follows:

	Bid.	Asked.
Atlantic and Pacific Telegraph	23	23½
Chicago and Northwest	33⅞	34
" " Pref.	64⅛	64¼
Chicago, Rock Island and Pacific	101	101½
Chicago, Bur. and Quincy	102½	103½
Col., Chic. and Ind. Cent.	3¾	4⅛
Clev., Col., Cin. and Ind.	40	40½
Cleveland and Pittsburgh	79	80
Chicago and Alton	77	77¾
Chicago and Alton Pref.	102	102½
Consolidation Coal	22	..
Canton	20	25
Delaware, Lack. and Western	49¾	50
Delaware and Hudson. Canal	45½	45½
Express—Adams	98¼	90½
" American	52½	53½
" United States	45	47
" Wells, Fargo & Co.	86¼	89
Erie	11½	11¾
Harlem	145	145½
Hannibal and St. Joseph	12⅛	12½
" " Pref.	27	28½
Illinois Central	73½	73¾
Kansas Pacific	3⅜	3⅞
Lake Shore	67⅜	67¾
Michigan Central	62¾	62⅞
Morris and Essex	75	76
Milwaukee and St. Paul	32¾	32⅞
" " Pref.	67¼	67½
Mariposa	1¼	1¾
" Pref.	1½	2
New York Central	106⅛	106⅜
New Jersey Central	14⅛	14⅜
New Jersey Southern	1⅜	1¾
Ohio and Mississippi	8¼	8⅞
" " Pref.	14½	15
Pacific Mail	23	23½
Pittsburgh and Fort Wayne	91	92
Quicksilver	17	18
" Pref.	35	36
St. Louis Kansas City Northern	4⅛	4¾
" " " Pref.	23	24
Toledo, Wabash and Western	15¼	15⅝
Union Pacific	67⅛	67⅜
Western Union Telegraph	79¼	79⅜

MINING STOCKS.

Mr. Ogden Haight, No. 65 Wall street, sends us the following report of the business of the New York Mining Stock Exchange for the week ending Nov. 6:

	Closing Quotations, in Currency.	Shares Sold.
Alpha	12.12½	500
American	4.12½	6,000
American Flag	.12	5,600
Belcher	5.00	300
Bertha & Edith	.07	8,200
Best & Belcher	17.87½	....
Bobtail	2.50	100
Bullion	6.00	100
Caledonia	2.37½	700
California	28.12½	50
Chollar Potosi	23.12½, ass'd $3	
Cleveland	7.00	200
Consolidated Imperial	1.00	....
Consolidated Virginia	26.50	....
Confidence	5.50	800
Crown Point	5.25	....
Eureka	47.25	200
Exchequer	4.75	....
Gould & Curry	8.87½	500
Hale & Norcross	7.37½, ass't p'd	600
Hukill	4.12½	1,300
Julia Consolidated	2.12½	100
Justice	10.00	100
Kentuck	6.25	1,300
Lacrosse	.29	7,200
Leopard	1.00	....
Memphis	.10	100
Mexican	11.25	....
Moose	6.62½	18,600
New York and Colorado	2.12½	2,000
Northern Belle	16.50	....
Ontario	24.00	550
Ophir	19.87½	400
Overman, ass'd $3	16.50	300
St. Joseph Lead.....offered at	5.00	....
Savage	8.62½	700
Segregated Belcher	32.50	....
Sierra Nevada	4.50	....
Union Consolidated	6.87½	....
Yellow Jacket	9.25	....

GENERAL HARDWARE.

Notwithstanding the lateness of the season and the absence of buyers from the city, there is a fair amount of business doing in both domestic and foreign Hardware. Very few changes and none of importance have occurred during the week.

The demand for Nails this week shows a slight improvement over last. The recently established rate, viz., $2.40, net, for 10d. to 60d., is still the nominal price, but orders for 100 kegs and over could easily be placed at a shade under this figure.

Tennis & Wilson, successors to J. Clark Wilson & Co., No. 81 Beekman street, have been appointed sole agents for the Snell Manufacturing Company, and will sell their entire production of Boring Machines, Augers, Auger Bits, Car Bits, &c.; they have also been appointed agents for the Davis Level and Tool Company's Plumbs, Levels and Iron Inclinometers.

It is rumored on good authority that the Reading Hardware Company, of Reading, Pa., have leased the works of the Keystone Hardware Company, of the same place. This action is expected to have a strengthening tendency on the specialties manufactured by these corporations, which have been irregular for a long time.

We call attention to the article on the opposite page on the Steel Center Self-sharpening Horse and Mule Shoes. These shoes are coming rapidly into use. They are manufactured by Thistlewood & Co., of Pittsburgh, Pa. The price is:

Self-sharpening Horse Shoes	per keg,	$5.25
" " Mule Shoes	"	5.75
" " Toe Calks	per ℔.,	.08

Buck Brothers, Millbury, Mass., have placed on the market a line of holiday goods which is worthy the attention of the trade. In presenting their price list for these goods they say: "We have been urged to make these small tools for boys and young gents to supply a want long felt. There have been plenty of boys' tools in the market, but, like Hodges' razors, made only to sell, some parties making all their tools of pig iron; other makers have put into the market goods they were ashamed to stamp with their own name. We warrant all the goods we make, and our friends will see we have so stated on all our labels." We print below their descriptive price list for these seasonable goods, which is subject to the same discount as their regular goods, viz., 17½ @ 20 per cent:

BUCK BROS.' HOLIDAY GOODS

For Christmas and New Year's Presents, or for any season, as the Tools are staple articles. Put up in various styles to suit all tastes.

No 1 is a splendid set of Tools, suitable for professional or amateur, in a superior Black Walnut Box $2.75
The set comprises the following named tools:
1 Drawing Knife, 4 inches, its superior not to be found in any market, retails for 55c.
3 Handled and Sharpened Firmer Chisels, ¼, ⅜ and ½ inch, retail for 25c. each.
2 Handled and Sharpened Firmer Gouges, ¼ and ½ inch, retail for 28c. each.
1 best L. P. Screw Driver, 3½ inches, retails for 23c.
1 C. S. Handled Scratch Awl, retails for 12c.
1 best quality Nail Set, retails for 12c.
1 C. S. Gimlet of fine quality, retails for 10c.
The box alone retails for 40c. The Tools are warranted of equal quality to the best goods we make.

No. 5, Contains precisely the same tools as No. 1, the difference being in the box only, the lid of the box being velvet-lined $3.00

No. 10, contains exactly the same tools as those in No. 1 and No. 5, but are put in a neat Pasteboard Box 2.40

No. 15, is an excellent set of Tools, somewhat smaller than No 1, yet every article is warranted, in fine Chestnut Box 1.80
Contains:
1 Drawing Knife, 4 inches, retails for 30c.
4 Handled and Sharpened Firmer Chisels, ¼, ⅜, ½ and ¾ inch, retail for 15c. each.
1 Handled and Sharpened Firmer Gouge, ½ inch, retails for 17c.
1 C. S. Screw Driver, 1½ inches, retails for 15c,
1 Handled Scratch Awl retails for 12c.
1 C. S. Gimblet of best quality, retails for 10c.
1 Excellent 6 inch rule, retails for 6c.
The box alone retails for 35c.

No. 20, Contains just the same Tools as No. 15, but are put in a neat Pasteboard Box... $1.50
This is the most salable kind so far in our experience, and we request our friends to buy one set as a sample, and if not found as we represent, we wish the box to be returned to us within 10 days, by mail, at our expense.

No. 25, in a fine Chestnut Box $1.25
Contains:
1 Drawing Knife, 4 inch.
3 Handled and Sharpened Firmer Chisels, ¼, ⅜ and ½ inch.
1 Handled and Sharpened Firmer Gouge, ½ inch.
1 Screw Driver.
1 Handled C. S. Scratch Awl.
1 Excellent 6-inch Rule.

No. 30, Contains the same Tools as No. 25, but are packed in a neat Pasteboard Box $1.25

No. 35, in a fine Chestnut Box $1.30
Contains:
1 Drawing Knife, 4 inches.
2 Handled and Sharpened Firmer Chisels, ¼ and ½ inch.
1 Handled and Sharpened Firmer Gouge, ½ inch.
1 Handled C. S. Scratch Awl.
1 C. S. Gimblet.

No. 40, Contains the same Tools as No. 35, but are packed in a neat Pasteboard Box $1.00

No. 45, in a splendid Black Walnut Box 1.15
Contains:
5 Handled and Sharpened Firmer Chisels, ¼, ⅜, ½, ⅝ and ¾ inch.
1 Handled and Sharpened Firmer Gouge, ½ inch.

No. 50, in a neat Pasteboard Box $0.90
Contains the same Tools as No. 45; and one of the very best assortments in the list.

Amateur's Carving Tools.

Of the very best quality, all Handled and Ground Sharp, put up in sets containing 3, 4, 6, 8, 10 and 12 Tools, and we can furnish any number—to 48 if desired—the average price of the same being 30c. each.

No. 1, is the set of which we sell the most—put in a superior Black Walnut Box. The set is made up of the following Tools: (6 Tools) $2.00
2 Chisels, ¼ and ½ inch, 25c. each.
2 Gouges, 1-16 and ¼ inch, 30c. each.
1 Front Bent Carving Chisel, 30c. each.
1 Front Bent Parting Tool, 40c. each.

No. 5. Contains exactly the same Tools as No. 1, but are packed in a neat Pasteboard Box. (6 Tools.) $1.75

No. 10, in a superior Black Walnut Box. (12 Tools.) 4.00
Contains:
4 Chisels, ¼, ⅜, ½ and ⅝ skew.
3 Gouges, 1-16, ¼ and ½ inch.
1 Front Bent Carving Chisel.
1 " " Parting Tool.
1 Straight " "
2 Front Bent Carving Gouges.

No. 15, Contains exactly the same Tools as No. 10, put up in neat Pasteboard Box. (12 Tools.) 3.60

No. 20, in a neat Pasteboard Box. (3 Tools.)... .90
Contains:
1 Chisel, ½ inch.
1 Gouge, ¼ inch.
1 Front Bent Parting Tool.

No. 25, in a neat Pasteboard Box (4 Tools)... $1.15
Contains:
2 Chisels, ½ and ½ inch.
1 Gouge, ¼ inch.
1 Front Bent Parting Tool.

No. 30, in a neat Pasteboard Box (8 Tools).... $2.40
Contains:
3 Chisels, ¼, ½ and ⅝ skew.
2 Gouges, 1-16 and ¼ inch.
1 Front Bent Carving Chisel.
1 " Parting Tool.
1 " Carving Gouge.

No. 35, in a superior Chestnut Box (10 Tools). $3.30
Contains:
3 Chisels, ¼, ½ and ⅝ skew.
3 Gouges, 1-16, ¼ and ½ inch.
1 Front Bent Carving Chisel.
1 " " Gouge.
1 " Parting Tool.
1 Straight "

No. 40, in a neat Pasteboard Box $3.00
Contains precisely the same Tools as No. 35.

Amateur Carving Tools not in sets, put up 1 dozen in a box, all Handled and Sharpened—

Chisels, ¼, ⅜, ½ and ⅝ skew	per doz.	$3.00
Gouges, 1-16, ¼ and ½ inch	"	3.50
Front Bent Chisels	"	3.80
" Gouges, 2 sizes	"	4.20
" Parting Tools	"	4.80
Straight Parting Tools	"	4.30
Small Cast Steel Hammers	"	4.00

Orders filled by mail for any single Tool to replace those which may have been sold. In all cases we charge the postage.

The Russell & Erwin Mfg. Co. have issued a circular in which they illustrate Barney & Berry's and Florence Skates. The net prices of Barney & Berry's Skates are as follows:

Net Prices.

	Per pair.
No. 2, Japanned Top	$1.50
No. 3, All Clamp	2.25
No. 4, Blue Top, Club	2.20
No. 5, Blue Top, Clamp	3.00
No. 6, Ice King	3.50
No. 7, All Clamp Rink	4.95

Extra Parts.

Heel Plates	per pair.	4c.
Single Keys		6c.
Single Clamps		10c.
Screws		10c.

We print below the net prices of Florence Skates:

	Per pair.
Florence Steel Skate	$0.45
The Florence Spring Skate (with Clamps and Straps combined)	2.00
Florence all Clamp Spring Skate	2.00
The Florence Bronze Skate—1876	1.20

They have also issued the following price list for Sleigh Bells, which is subject to discount 20 per cent.:

RUSSELL & ERWIN MANUFACTURING COMPANY'S SLEIGH BELLS—1877.

Arctic Sleigh Bells.

The "Arctic" is made of one piece of sheet metal, and with double the vibrating surface of a common Bell. Patented Oct. 24, 1876.

Common Tinned Bell.

Russet or Harness Leather on Plain Body Strap, Buckle and Billet riveted on.

	Per strap.
No. 1, 24 Bells, Riveted to Strap	$2.60
No. 2, 30 " "	3.00
No. 3, 36 " "	3.50
No. 4, 42 " "	3.75

Extra White Metal Polished.

On same Strap as Common Tinned.

	Per strap.
No. 5, 30 Bells, Extra Polished	$3.40
No. 6, 36 " "	3.90
No. 7, 42 " "	4.15
No. 8, 48 " "	4.65

Extra Nickel-Plated.

Plain Body Strap. Buckle and Billet stitched on.

	Per strap.
No. 9, 30 Bells	$5.50
No. 10, 36 "	6.00
No. 11, 42 "	6.30
No. 12, 48 "	6.60

In ordering, Black Straps will be sent unless Russet is specified.

Extra Nickel-Plated.

On Bound Strap, Enamel Leather Binding, Covered Buckle. Billet and Buckle stitched on.

	Per strap.
No. 13, 36 Bells	$7.50
No. 14, 42 "	7.80
No. 15, 48 "	8.10

Extra Nickel-Plated.

Broadway Strap, Covered Buckle, Waved and Stitched Billet.

No. 16, 36 Bells	$10.00
No. 17, 42 "	10.50
No. 18, 48 "	10.75

Heavy Gold Plated.

Covered Buckle, Stitched Billet, Leather Binding and Velvet Center.

	Per strap.
No. 19, 42 Bells	$12.00
No. 40, 45 "	14.00
No. 21, 48 "	15.00

Broadway Strap.

Heavy Gold Plated.

	Per strap.
No. 22, 42 Bells	$14.00
No. 23, 45 "	15.00
No. 24, 48 "	16.00

Chime Shaft Bells.

Made from Sheet Metal of superior tone. Extra Nickel-plated.

	Per set.
No. 27, 6 to set, on leather strap	$4.25
No. 28, 6 to set, on iron strap	4.25

All of the bells on this price list are made from sheet metal.

We also have our usual complete stock of Bevins' Bells, including Loose Round, Open Polished, and White Metal Bells; Common Neck, and Body Straps; Fancy White Metal and Plated Straps; Dexter Straps, Shaft Chimes, etc. A complete descriptive list with prices, will be sent on application.

The discount off Providence Tool Co.'s list of Tackle Blocks has been changed from 30 and 10 to 40 per cent.

Henry Disston & Sons illustrate, in their advertisement on the 29th page, a variety of tools for keeping Saws in order, among which are three styles of Gummers, an improved Side File, the Conqueror Swage, Saw Set, &c. They inform us that these tools are the latest and best articles of the kind made, and if on trial they should not prove all that they claim for them, they will be taken back and the money refunded. They also show a cut of Disston's Patent Gullet Tooth Circular Saw, for which they claim important advantages over the ordinary Circular Saw. In their printed description of this Saw, after describing the manner of sharpening, the saving of the saw plate by the use of a smaller tooth, &c., they say: "The crowning triumph of this saw is the fact that it can be kept in order with one-tenth the labor of any other saw, and is bound to preserve its true circular shape; whereas, by the old method of filing both on back and front, it is impossible to keep a saw round." These goods are fully warranted and are made of the best materials.

A. A. Weeks, No. 82 John street, illustrates, in his advertisement on the 32d page, Week's Reversible Sad and Polishing Iron. This iron is made to revolve in a handle having two flat surfaces; both surfaces are polished, one presenting the same face that an ordinary Smoothing Iron has, and intended to be used as such, the other has the heel ground off in the same manner as the ordinary Polishing Iron. Both surfaces are nickel-plated. The iron is held in position by two locking pins, as seen in the cut. In order to change the surface from Smoothing to Polishing Iron or the reverse, merely press the lever so as to disengage the locking pins, revolve the iron and allow the pins to again enter the holes, and the iron is ready for use. These goods are offered to the trade at $7.50 per dozen, less discount 10 per cent.

We invite the attention of the trade to Morton's "Clipper" Scroll Saw, an illustration of which will be found in the advertisement of James D. Foot, No. 22 Platt street, on page 25. We take the following from a descriptive circular regarding this machine:

"It admits of doing work with as great a degree of precision as does the most costly sawing machine; and after a little practice, with almost as much rapidity. The workmanship of the "Clipper" is of the very best, and its general appearance exceedingly trim and admirable. The Base and Saw Table are of walnut, and the arms of ash, both selected woods. The casings are smooth and nicely japanned. It swings 15 inches between saw blade and frame. Price, with clamp to fasten to a table, $2.50."

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Nov. 7, 1877.

Scotch Pig.—Since last report the market has been depressed, but is firmer now, and prices are stronger. The following are makers' quotations:

Coltness No. 1	65/6
Glengarnock No. 1	59/
Eglinton No. 1	54/6

Manufactured Iron.—There is a falling off in the demand, and but little is doing. Quotations are nominally for best Staffordshire bars £7. 10/ @ £8. 10/.

Rails.—There is a very fair business doing in Rails, and quotations are firm at prices last reported.

IRON.

American Pig.—The demand for Pig Iron during the week has been moderate and confined to small lots for prompt delivery. Sales are reported in lots aggregating about 500 tons No. 1 at $19 @ $20. We do not hear of any large transactions. The feeling in the market is generally reported good, and favorite Lehigh brands continue in short supply. We quote at unchanged figures: Foundry No. 1, $18 @ $19; Foundry, No. 2, $17 @ $18; Gray Forge, $16 @ $17.

Scotch Pig.—Since our last writing 300 tons of Scotch Pig, mostly sold to arrive, reached this port. Sales during the week have been confined to small lots for consumption. We quote: Glengarnock, $25; Eglinton, $23.50 @ $24, and Coltness, $26 @ $26.50.

Rails.—Although we hear of considerable inquiry for Steel Rails, the transactions during the week, if any, have not transpired. Some of the companies are so full of orders that for the present, so far as prompt delivery is concerned, they are practically out of the market. The low price at which Steel Rails have been sold has left Iron Rails in a very neglected condition. We quote: Steel, nominally $42 @ $45, and Iron, $33 @ $37, both at mill.

Old Rails.—In the absence of business we continue to quote $18 @ $18.50, which is the nominal price.

Scrap.—Wrought Scrap from yard is quoted at $22 @ $23. No business of any magnitude is reported.

METALS.

Copper.—The week's sales have been restricted to 200,000 pounds Lake Copper at 17¾c. @ 17⅞c., which is also the closing figure. Baltimore we quote 18c., nominally. Little Copper is offering, but the demand is less still. In futures nothing has transpired; holders are generally firm. Best Selected is telegraphed £72, and Chili Bars are quoted £65, a decline of 10/. The auction sale of Australian Copper came off at London yesterday; 800 tons Wallaroo and 200 Burra-Burra sold at an averaga of about £74. Mail advices have reached us from the same quarter, dated Oct. 25, according to which Copper was dull and lifeless, the asking prices being: Tough Ingots, £73; Best Selected, £74; Manufactured, £77; Yellow Metal, Rods and Sheathing, 6½d. per pound; all free on board, less 2½ and 1 per cent. There continues a fair demand for Manufactured Copper and Yellow Metal at unchanged prices. We quote: New Sheathing Copper, 28c.; and Bolts and Braziers, 30c.; Yellow Metal Sheathing, 20c.; Yellow Metal Bolts, 25c.; and Nails, 20c., net cash.

Tin.—Our market is steady at the following rates for large lots, gold: Straits, 16¼c.; English Refined, 15⅞c. @ 16c.; ditto Common, 15½c. @ 15⅝c.; and Banca, 18c. @ 18½c. London cables for Straits, £70. 10/. The deliveries in England and Holland, during October, the cable informs us, were 2000 tons, against 1400 tons in September, which shows that confidence is felt in present prices. The exports from the Straits in October were 360 tons to the United States and only 80 tons to England. These continued small exports to Europe have already had the effect of reducing the London stock to some extent. Mail advices are to hand from Batavia (Java) to Sept. 10, according to which the stock of Tin at Banca on March 31 was 66,754 piculs, to which there had been added, up to June 30, some 3163 piculs, making together 69,917, out of which there had been shipped to Java during the second quarter of the year, 9210, leaving a stock on hand July 1 of 60,707 piculs. *Tin Plates.*—There is a good demand for and a light stock of all kinds of Plates except Charcoal Bright. We quote the latter, in gold, per box, large lines, ordinary brands, $6.50 @ $6.62½; ditto Ternes, $6.12½ @ $6.25; Coke Tin, $5.65 @ $5.75; and Ternes ditto, $5.37½ @ $5.50. The following has been received by mail from Liverpool, dated Oct. 25: "During the past week large sales of Coke Tins have been made, and low prices for prompt delivery in good brands are not now so readily obtainable. Ternes, both Coke and Charcoal, continue in quite good demand at rates last advised, while the weak spot is decidedly charcoal Tins which, from the lowest to the highest qualities, have been left without buyers, in spite of concessions offered by makers, both for prompt and forward delivery." We would add that Tin Plates will from now forward be looking up generally, in all likelihood, in sympathy with the advance in Block Tin.

Lead.—A considerable quantity of Lead seems to have changed owners among some speculative parties, on the spot, it is rumored some 800 tons, at a price held secret, but supposed to have been 4.60c., currency. The stock here is daily becoming more concentrated in a few hands, and is held out of the market. Soft Missouri Lead can, however, still be procured from St. Louis at 4⅜c., currency, there, equal to 4¾c., currency, here. Select is selling at St. Louis at 4½c., currency. Leading holders here would not be willing sellers to-day at anything below 5c., currency, and even at this figure large lots would not be obtainable. Mr. E. A. Caswell, of this city, furnishes us the following statistics: Lead in store, 3025 tons; at smelting works in and about New York, 1800; Lead and bullion in transit from California by water (shipped), 1520; base bullion in transit by rail (Lead ready this month and next), 600, and finally Western Lead already bought for Eastern delivery, 750; together, 7695 tons in sight. These statistics show that there will be no lack of Lead, and we are now awaiting the consumptive demand to take charge of it. From England, Oct. 25, we have the following by mail to-day: "Smelters mostly are too full of work to deliver promptly, but are disposed to accept a reduction for forward delivery. Values we make: English Pig, £20. 2/6; Sheet, £21. 5/." Manufactured is in steady, fair request at unchanged prices. We quote: Bar, 7c.; Pipe, 7½c.; Sheet, 8c.; and Tin-Lined Lead Pipe, 15c., all less 10 per cent. to the trade.

Spelter and Zinc.—Domestic Spelter moves off in but moderate quantities, and we cannot quote the same any higher than 5¾c. @ 6c., currency, to-day. Of Foreign there is none. We quote it nominally, 6¼c., gold. At Breslau, according to accounts thence, dated Oct. 22, 10,000 cwts. Hohenlohe sold at 18.10 marks the 50 kilos on the spot, and 2000 cwts. Godulla at 18.40 marks for November delivery. Aside therefrom a large purchase was spoken of as having been made for export, but there were no particulars. This suffices to prove that Spelter is getting to be more active on the Continent. *Sheet Zinc.*—Sheet is very quiet, but prices are unaltered. We quote: Mossel-mann, 8c. @ 8½c., gold, and Domestic, 7⅜c. @ 7½c., currency.

Nickel—Is dull at $1.65 @ $1.85, gold, per pound.

Antimony.—The Cookson brand is pretty much all sold out, a lot having been taken at 13⅜c., gold, yesterday. An inferior brand of Antimony sells at 12¼c. @ 12½c., gold.

OLD METALS, PAPER STOCK, &c.

Nothing of importance has occurred in the condition of the market for Old Metals, Rags, Paper Stock and other junk materials during the period that has elapsed since the date of our last. Business in all departments is very trivial. An occasional large sale is effected, but this is an exception and not the rule, as buyers are holding off and cannot be induced to purchase any considerable quantity.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper	per ℔.	$0.13	@	$0.14
Yellow Metal	"	.10	@	....
Brass, heavy	"	.09½	@	....
Brass, light	"	.08½	@	....
Composition, heavy	"	.11½	@	....
Lead, solid	"	.03¾	@	....
Tea Lead	"	.03	@	....
Zinc	"	.03½	@	....
Pewter, No. 1	"	.11	@	....
Pewter, No. 2	"	.07	@	....
Spelter	"	.05½	@	....
Wrought Iron	pr ton.	17.00	@	....
Light do	"	11.50	@	....
Stove Plate	"	9.50	@	....
Machinery do	"	12.00	@	....
Grate Bars	"	5.00	@	....

The prices current for Rags, &c., are as follows:

Canvas, Linen		4½c.	@	5 c.
" Cotton, No. 1		5½c.	@	....
" " No. 2		2½c.	@	....
White No. 1		4¼c.	@	....
" No. 2		2¼c.	@	....
Colored do		2 c.	@	....
Mixed, Woolen		2 c.	@	3 c.
Soft, do		5½c.	@	6 c.
Gunny Bagging		3 c.	@	....
Jute Butts		2¼c.	@	....

Kentucky Bagging	3 c. @ ....
Book Stock	2½c. @ ....
Newspaper Stock	2 c. @ 2¼c.
Waste Paper and Scraps	1½c. @ ....
Kentucky Bale Rope	4 c. @ ....
Oakum Junk, No. 1	4½c. @ 5 c.
" No. 2	3 c. @ ....
Tarred Shaking	1 c. @ 1¼c.
Grass Rope	1 c. @ 1¼c.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Nov. 6, 1877:

	Quan.	Value.
Dutch West Indies.		
Pumps, pkgs..	1	$60
Hamburg.		
Belting, cs.....	8	2,760
Ag. Imp., pgs.	5	450
Mach'y, cs....	17	2,384
Cop'r ore, sks.	1045	10,000
Spelter, slabs.	1247	3,752
Sew. mach., cs	47	3,258
Hdw., cs.....	101	2,862
Clocks, cs....	190	2,308
Bremen.		
Hdw., pkgs...	23	1,191
Ag. imp., pkgs	36	2,085
Lamps, cs....	4	200
M't'l goods, cs	1	217
Liverpool.		
Mach'y, cs.....	28	3,440
L'p goods, pgs	55	3,255
Ag. imp., pkgs	15	293
Hdw., cs.....	40	2,649
Steel blooms..	222	6,426
Tin, cs.....	4	212
Mf. iron, pkgs.	30	566
Spelter, slabs.	349	1,000
Clocks, cs.....	166	5,386
Carbines, cs..	1	480
London.		
Machy., cs.....	9	2,894
Sew. mach., cs	17	775
Hdw., cs.....	10	424
Rotterdam.		
Mach'y, pkgs	10	1,630
Pumps, pkgs..	26	1,600
Havre.		
Copper, bbls..	180	45,000
Sew. mach., cs	24	1,816
Ag. Imp., cs...	39	3,071
Lisbon.		
Clocks, bxs....	154	2,244
Glasgow.		
Ag. imp., pgs.	20	483
Mach'y, cs....	1	100
Belting, cs....	6	1,730
Pumps, cs.....	2	175
Canada.		
Clocks, cs.....	2	250
British North American Colonies.		
Coal, tons....	280	810
Mf. iron, pkgs.	85	724
Mach'y, pkgs.	10	756
Hdw., pkgs...	8	85
Pig iron, tons.	25	450
Iron plates....	50	263
British West Indies.		
Lamps, pkgs..	4	143
Nails, kegs....	46	141
Carriages.....	5	1,475
Gun caps, cs..	2	475
Truss h'ps, pgs	3	124
Burners, cs...	1	63
Mf. iron, pkgs	25	437
Ag. imp., cs...	2	118
Hdw., pkgs...	81	1,249
Clocks, cs.....	28	488
C'ge mtls., pgs	4	400
British Guiana.		
Carriages. ...	4	1,400
British Australia.		
Ag. imp., pkgs	24	285
Mach'y, cs....	3	275
Hdw., pkgs...	56	959
Cuba.		
Pumps, pkgs..	6	583
Gas fixt's, cs..	2	78
Hdw., pkgs...	105	2,147
Boiler.....	1	400
Mf. iron, pkgs.	177	1,342
Mach'y, pkgs.	775	43,279
Lamps, pkgs.	7	181
Cutlery, bxs..	4	105
S'dpaper, pgs.	4	119
Sew. mach., cs	12	100
Iron plates...	5	168
Car wheels...	32	664
Clocks, pkgs..	15	120
Spikes, kegs..	20	75
Nails, kegs....	149	343
Belting, pkg.	1	368
Ag. imp., pgs.	15	1,300
Porto Rico.		
Nails, kegs....	125	347
Iron safe.....	1	250
Ag. imp., pkgs	20	261
Hayti.		
R r iron, bars.	711	5,560
Spikes, kegs..	93	465
Iron safes	3	310
Steel, cs.....	1	95
Nails, kegs....	62	172
Hdw., cs.....	78	1,521
Chains, cask.	1	57
Sew. mach. cs.	13	608
Cutlery, bxs..	2	52
Guns, cs.....	28	1,460
Clocks, cs.....	2	72
Mf. iron, pkgs.	36	575
Axles, cs.....	10	255
Cartridges, cs.	25	750
Mach'y, pkgs.	61	1,760
Mexico.		
R. R. cars.....	2	2,414
Firearms, cs...	1	1,000
Ag. imp., pkgs	2	26
Nails, cs.....	5	40
Hdw., cs.....	13	282
Cutlery, pkgs.	9	560
United States of Colombia.		
Ag. imp., pkgs	106	3,269
Sew. mach., cs	89	2,680
Cutlery, pkgs.	148	5,987
Rifles, cs.....	20	617
Pumps, pkgs.	2	152
Revolvers, pgs	1	38
Mf. iron, pkgs.	558	6,089
Mach'y, pkgs	515	45,055
Cartridges, cs.	118	4,320
Watches, cs..	1	1,300
Powder, lbs...	462	116
Hdw., cs	100	4,341
Clocks, cs.....	10	918
China.		
Hdw., cs.....	4	157
Guns, case....	1	130
Pumps, cs.....	2	50
C'tridges, cs...	32	960
Venezuela.		
Sew. mach., bx	8	107
Revolvers, cs.	4	1,210
Hdw., pkgs...	19	125
Nails, kegs....	9	27
Brazil.		
Hdw., cs.....	90	1,675
Cutlery, cs....	8	512
Shoe nails, cs..	8	62
Ag. imp., pgs.	12	108
Mf. iron, pkgs	40	519
Tacks, bxs...	12	103
Sew. mach., cs	29	823
Lamps, pkgs..	84	989
Nails, kegs....	54	137

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Nov. 5, 1877:

Hardware.

Boker Hermann & Co.
Cases, 3
Casks, 6
Cntlery, cs., 1
Cutlery, cks., 1
Brokhahne, W.
Whetstones, pks., 48
Brown Bros. & Co.
Files, cks., 4
Crossman W. H. & Bros.
Cases, 1
Carey S.
Millstones, cks., 33
Grindstones, cks., 6
Carey & Moen,
Wire, coils, 352
Folsom H. & D.
Mdse., pkgs., 6
Grinnel H.
Cases, 1
Homer & Sprague,
Saws, cases, 3
Harmar W. & Co.
Mdse., pkgs., 4
Harrison Bros. & Howson
Cases, 2
Levi Bros.
Packages, 2
Laughland & Co.
Wire, bls., 160
Wire, cks., 1
Livingston W. & F.
Millstones, cks., 21
Moore's J. P. Sons,
Wads, cs., 7
Mdse., pkgs., 9
Montgomery J. M.
Cases, 1
Mason J. W. & Co,
Wire rope, coils, 11
Piza D. M.
Revolvers, bxs., 1
Rosenfield Bros. & Co.
Cases, 3
Schoverling & Daly,
Wads, cs., 7
Mdse., pkgs, 8
Tillottson L. G.
Galv'd wire, lots, 209
Von Cleff & Co.
Ironware, cs., 8
Wetzlar M.
Ironware, cs., 19
Ward Asline,
Mdse., pkgs., 3
Wiebusch & Hilger Hdw. Co.
Hrdw'e, and cutl'ry, pkgs., 32
Order,
Grindstones, 120
Chains, cks., 14
Packages, 13
Files, cks., 4

Iron.

Henderson Bros.
Pig, tons, 400
Mitander Nils,
Coils, 2063
Bars, 2383
Naylor & Co.
Scrap, cs., 263
Bars, 16,085
Coils, 1146
Pullman Palace Car Co.
Packages, 40
Springs, cs., 4
Perkins, Livingstone & Post,
Cast, kilos, 300,000
Page, Newall & Co.,
Bars, 170
Phelps, Dodge & Co.
Sheet, bdls., 217
Robbins C. & Son,
Boxes, 100
Order,
Pig, tons, 150
Bars, 4751

Steel.

Sulzbacher, Hymen & Wolffe,
Cast ste'l rolled wire, pkgs., 212
Woodford W. O.
Cases, 6
Bundles, 100
Bars, 6
Order,
Rods, bdls., 25
Cases, 5
Bundles, 56

Metals.

Bear J. & Sons,
Tin plates, bxs., 150
Cumming Allan,
Tin plates, bxs., 10
Montell F. J. & Sons,
Scrap brass, bbls., 5
Meyer Moritz,
Ore, sacks, 245
Naylor & Co.
Tin plates, bxs., 1828
Phelps, Dodge & Co.
Tin plates, bxs., 13,287
Robertson H.
Copper ore, bags, 359
Trowbridge D. & Co.
Scrap cop'r, pkgs., 7
Scrap brass, pks., 12
Scrap lead, pkgs., 23
Wheeler E. S. & Co.
Mdse., pkgs., 2
Order,
Tin, ingots, 1191
Tin, slabs, 240
Tin plates, bxs., 6059
Lead, bars, 792
Black taggers, bxs., 100
Antimony, cks., 25

COAL.

Trade at the present time is very brisk, almost all the companies having as much as they can do, while many individual operators are behind their orders on manufacturing sizes. Prices are well sustained at last week's quotations. Vessels, owing to the bad weather, are very scarce at the present moment, and freights, which have been very tiff, are advancing. Trade is so brisk, owever, that rates will probably remain retty high until the end of the season.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, November 7, 1877.

The business outlook continues to give evidences of improvement, and, compared with the corresponding date of last year, there is already considerably more work under way, including several important contracts just closed and others likely to be closed within a few days. In an article on the 18th page will be found details of a very important contract which has been sublet to the Reading Coal and Iron Co., which will require 14,000 tons Iron Rails and a large number of cars, locomotives, &c. Another important contract is that with Messrs. Wm. Cramp & Sons, while Neafie & Levy have also a large amount of work on hand, and at Chester, Pa., Messrs. Roach & Son have two or three large steamers to build during the winter, with prospects of further orders at an early date. In fact, there is a very fair degree of work under way at all the iron ship yards, with indications of a moderate winter's business in every department connected with that industry.

Pig Iron.—The market remains in about the same condition as on date of our last report. The demand is steadily maintained and is of the same character which we have noted for several weeks past. Standard brands of Foundry Irons are readily taken at current quotations, and at the present time there appears to be no probability of stocks accumulating. In fact, we cannot learn that any of the companies are carrying stock, and in several instances considerable orders have been entered for forward delivery. The immediate condition of the trade is entirely satisfactory so far as the amount of business is concerned. The fear seems to be, now that the year is drawing to a close, there may be another period of dullness and depression, which might unfavorably affect prices. As we showed last week, consumption of iron has been increasing for some time past, and the last three months have been of more uniform firmness in prices than during any similar period for two or three years past; in fact, reference to our reports shows that for the last two years, down to the end of August, the decline was continuous. Since that date the market has been steady, and although not quotably higher, it is, in fact, higher, inasmuch as all sales are now believed to be upon the basis of current quotations; previously they were only nominally so. The next three or four weeks will, no doubt, be a critical period, as some portion of the demand will probably be withdrawn from the market. The stove trade, for instance, which has been one of unexpected activity and among the steadiest class of buyers, is not likely to continue brisk much longer, and unless a corresponding demand arises from other sources, the effect will soon be manifest. In the meantime the evidences of improvement in general business appears to be of such a character as to warrant favorable anticipations in regard to the iron trade, and it is not probable that any serious or protracted relapse will occur, although the near approach of the holidays, etc., may tend to check business for the next few weeks. We hear of several lots (one of 5000 tons) of hypothecated Iron changing hands at extremely low prices, but the general market is steady at late quotations, say: No. 1 Foundry, $18 to 19.50; No. 2 do., $17 to $18; Gray Forge, $16 to $18; Mottled, $14.50 to $15, with continued large offerings of the lower grades.

Blooms.—We quote: Sunken Scrap Blooms (2464 lbs.), $42 to $45; Northern Ore Blooms (2240 lbs.), $37 to $39; best quality Charcoal Billets (2240 lbs.), for wire and steel purposes, $50 to $55; Bars, do., $65 to $67.50; Sheet Iron Blooms, cornered (2464 lbs.), $60 to $62.50: Cold-blast Charcoal Plate Blooms, $55 to $57.50; run out Anthracite, $50 to $52.50.

Plate and Tank Iron.—In some quarters we hear complaints of dullness and depression, while from others we obtain more favorable reports. The demand of late has been chiefly for small lots for immediate use, so that a few days of inactivity is felt at the mills very quickly. There is, however, a fair average business doing, with reasonable prospects of a better demand during the coming week. Inquiries are being made for considerable quantities, some of which will no doubt result in business at an early date. The amount of work in progress at the various ship-yards, in addition to most other branches using plates, seems to indicate a fair business to manufacturers, although for the time being we cannot report any special activity. Prices are unchanged but rather weak, as follows: Common Plates, 2.3c. to 2.4c.; Tank Iron, 2.3c. to 2.7c.; C. No. 1, 2.4c. to 2.6c.; Shell Iron, 2.85c. to 3c.; Flange Iron, 3.85c. to 4.25c.; Solid Fire Box, 4.85c. to 5c., and Best Bloom, 5.5c. to 6c.

Sheet Iron.—The trade continues in the some condition as noted last week—dull and disappointing. It is somewhat singular that the stove trade has been and still continues exceedingly active, while the demand for Sheet Iron has been just the reverse. There is some hope that the trade may brighten up yet, but the prospects are not very flattering, and manufacturers have about concluded that the season will be a poor one, both as regards quantity marketed and prices realized. Stocks are light, however, both with dealers and consumers, and the advent of cold weather will no doubt create activity if there is going to be any at all. Prices are easy at late quotations as follows: Refined Sheet Iron, No. 26 to 28, 3¼c.; No. 22 to 24, 3½c.; No. 16 to 21, 3¼c.; Best Bloom Sheets, No. 26 to 28, 5½c.; No. 22 to 24, 5¼c.; No. 16 to 21, 5c.; Common Red Plates, 5-16 to 18, 2⅜c. to 2½c.; Refined Plates or Blue Annealed, 5-16 to 18, 2¾c.; American R. G., 5-16 to 18, 3¼c.; Best Bloom, 5-16 to 18, 5c.; Philadelphia Russia, 8c.; A. Patent Planished, 10½c.; B. Patent Planished, 9½c.; Bloom Galvanized, 40 per cent.; Refined Galvanized, 50 per cent.

Bar Iron.—There has been a somewhat better demand during the past week, and nearly all the mills appear to be fairly employed. There is scarcely any improvement in ordinary Bar Iron, but small Mill Irons are scarce and in active request. Prices are not what they ought to be, however, but if the present demand continues there will no doubt, after a while, be less cutting and a more uniform range of prices. We have not heard anything of Western Irons latterly, and it seems as though the local mills are supplying the demand free from outside competition. We cannot learn that any orders of importance have been secured the increased business being of a hand-to-mouth character, and in part owing to a larger consumption, but more, perhaps, to the absence of Western competition. While we do not find anything to warrant very confident predictions in regard to the future, it is safe to say that there is quite an improvement compared with many preceding weeks. We continue late quotations as follows: Common Iron, 1.50c. to 1.70c., and Best Refined, from 2c. to 2.10c.

Muck Bar.—A few sales of small lots have been made at $33, at which figure it is freely offered. We quote $32 to $33 for best quality of Refined Iron.

Steel Rails.—There has been a moderately active demand since date of our last report, and several thousand tons have been placed at prices about same as current last week, say $40 to $42, at mills. There are further inquiries, and it is likely that a fair amount of additional business will be entered before the close of the month. The mills have secured sufficient orders to keep them fully employed for a considerable period, however, and are less disposed to make concessions than they were some weeks ago, although it is quite likely that large lots for cash could be had as low as ever. In the meantime we quote latest sales $40 to $42, cash, at mills, market steady.

Iron Rails.—The week past has been one of a somewhat encouraging nature, the sale of 14,000 tons for shipment to Brazil by the Reading Coal and Iron Company being the leading feature. We understand there has been other sales to Cuban buyers, but the details have not been made public. The aggregate, however, will reach large figures, although it is supposed prices have been cut down to a low point. Beyond these foreign orders we do not hear of any additional transactions. There are inquiries from the South, however, which will probably lead to business at an early date. Quotations remain as before, say, $32 to $35 at mills, according to section, quality and terms of payment.

Old Rails.—We have again to note large transactions in Old Rails, and the market is firm and somewhat higher. There are very few offering for spot delivery, and $20 is the usual asking price, with sales said to be at about that rate. One lot of 4000 tons from the Delaware and Hudson Canal Company, it is said, will cost that figure delivered at a point near this city. A few other lots have changed hands at $19.50, which may now be considered an inside price. Buyers are endeavoring to make contracts for future delivery, as it is believed Old Rails are becoming scarce, and from the present appearance of the Iron market, there is but little chance of securing anything cheaper at the prices now ruling, say, $19.50 to $20, according to terms and quality.

Old Car Wheels.—Prices are entirely nominal, with no sales reported for some time. Holders ask $18 to $18.50.

Old Car Axles are entirely nominal at $24 to $26.

Scrap Iron.—The market is dull and heavy at late quotations. Sales are chiefly at inside rates, say: Wrought, $22 to $23.50; Cast, $14.50 to $16.

Nails.—The demand is reported to be quite satisfactory, with some increase in sales to outside points. New Orleans, Cuba, &c. quotations remain as before: $2.40 to the trade, and $2.50 to consumers.

Lead.—The firmness noted in our last still continues holders contend for a further advance, which buyers for the time being seem unwilling to meet. We quote: Common, 4.75c. and Refined at 5c. Manufactured is unchanged but firm at late quotations. The Shot trade is still active at former rates. We quote: Bar, 7c.; Pipe, 7½c.; and Sheet, 8c. Shot, Drop, 8¾c. to 9¾c.; Buck, 9¾c. to 10¼c., all less 10 per cent. to the trade.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, Nov. 6, 1877.

The general improvement in business noted in my report of last week still continues. Manufacturers, as a rule, are well supplied with orders, and but for prices, which are being cut very close, there would be no cause of complaint. The great trouble in manufacturing circles for some years past, since the panic, has come from over-production, and while this continues, values must of necessity continue unremunerative; but with an increased consumption, of which there is every prospect at the present, makers will be enabled to obtain better rates. Nearly all the leading manufactured goods here are down as low now as they were before the war, and as the cost of production has been reduced to the very lowest limit, there is no room to longer doubt that hard pan has been reached. It is evident from the numerous strikes that the cost of labor is much more likely to be increased than reduced; and then coal, another very important element in connection with the production of manufactured goods, is higher now than it was last spring. The advices from the West and South continue of a most favorable character, the crops—of which there was a most prolific yield—having been secured in good condition, and the indications are that the demand for all kinds of manufactured goods will be much larger this coming winter and spring than it has been for years past.

Pig Iron.—The general position of the market remains much the same as noted in my last report. There is a steady consumptive demand, and while prices have undergone no change, the increased consumption within the past few weeks has developed a more confident feeling on the part of sellers, and then the fact that stocks, particularly of well-known brands, are comparatively light, is not without its influence in the same direction. The trade generally do not anticipate any material advance soon; however, some operators expect to be able to obtain an advance of 50c. to $1 per ton on best brands of Gray Forge before long, and as the demand is increasing and the stock of this particular kind is light, we should not be surprised if their expectations were realized. The mills, as a rule, have fair stocks of common Iron, bought some four or five weeks ago, when it was cheaper than it now is, and they want more or less good Western red-short for mixture to bring up the quality of the former. It is hinted that a good deal of the Eastern Coke Iron, bought in September and the early part of October at such low figures, of which mention was made in *The Iron Age* at the time, is not turning out very satisfactorily, that the quality of the product is not very desirable, and this accounts for the increased demand for good Western Irons. The stock of good Foundry Iron is also reported light, and, notwithstanding the inquiry is chiefly for small lots, a firmer feeling is being developed. Quotations for the various grades may be given as follows:

Bituminous Coal Smelted.

No. 1 Foundry, 4 mos	$22.00 @ 22.50
No. 2 Foundry, 4 mos	20.00 @ 21.00
Gray Forge, red-short, 4 mos	20.50 @ 21.00
Gray Forge, neutral, 4 mos	19.00 @ 20.00

Eastern Coke.

No. 1 Foundry, 4 mos	$21.00 @ 22.00
Gray Forge, neutral, 4 mos	18.00 @ 18.50

Hanging Rock Charcoal.

No. 1 Foundry, 4 mos	$26.00 @ 28.00
No. 2 Foundry, 4 mos	24.00 @ 25.00

Charcoal Blooms.

Fair to best, 4 mos	$55.00 @ 59.00

Manufactured Iron.—The activity noted in last report continues, and while the mills generally are not very anxious for orders, in consequence of prices being unsatisfactory, they have about all they can do, notwithstanding they are working double turn. The mills west of here in the Shenango and Mahoning Valleys are also very busy; some of them it is said have orders enough booked to absorb their production for several months to come, and it is intimated that they, to a considerable degree, are responsible for the unsatisfactory condition of the market in regard to prices. That business is active here is evident from the shipments which, both by river and rail, have been heavy for some weeks, and makers are hopeful, in view of the largely increased demand and consumption as well, of being able, before long, to obtain better prices. While it is true that iron for many purposes is being supplanted by steel, it is well to bear in mind in this connection, that for many purposes, it is taking the place of wood, and its cheapness at the present time, must of necessity increase the consumption. Iron buildings and iron bridges are becoming very common, and for these and many other ordinary purposes the demand is greater now than ever before. Prices quotable as follows: Bars, 1.75 to 1.85 rates; sheet, 2.85 to 2.90 rates; hoop, 2.50 rates; tank, 2.60 to 2.75 rates; with the usual 60 days and 2 per cent. off for cash.

Nails.—The market continues moderately active, about all that can be expected at this season of the year, as the busiest part of the fall trade is usually over by the 1st of November; no change in rates; $2.15, 60 days, with 2 per cent. off for cash. The market has been in an unsatisfactory condition for makers all fall, owing to prices being unremunerative; there was a very fair trade, and there was no trouble in obtaining orders at the rates, which unfortunately were forced down to about the cost of production and kept there, and while there was an object in putting prices so low, it is doubtful whether the end justified the means. There is reason to believe that there would have been just as many wanted at $2.25, 60 days, as $2.15, and the former figure could have been just as easily obtained as the latter if it had been demanded.

Horse and Mule Shoes.—The demand continues moderately active; no change in prices. Shoenberger & Co. continue to quote Juniata, in 100-keg lots, at $3.80 and $4.80.

Steel.—There is a continued steady demand for all the leading makes. Manufacturers all appear to be busy, and there is every indication that this will continue during the remainder of the year. The fact is, so far as business is concerned, makers have had no reason to complain for several years past, and while they admit a largely increased trade, they allege that owing to an increased competition, the result of an enlarged capacity, they are making less money. Tool steel is quotable at 12c. to 13c.; we hear of sales of very common as low as 11c., and there are some very fine brands—"Black Diamond," for instance—which are held at 14c. Machinery Steel, 8c. to 8½c.; Plow do., 8c. to 10c.; Fire do., 4¾c. to 5c.

Wrought Pipe.—There is apparently no let up in the demand, which has been unusually active for several months past, but the consumption generally falls off considerably when the cold weather sets in, thereby curtailing out-door work. No change in rates; discounts quotable at 57½ to 60 per cent. That business is active is evident from the fact that the National Tube Works recently shipped 172 car loads in nine days.

Scrap.—Old Rails are reported firmer, but prices remain about as last quoted, $20, cash, to $20.50 to $21, 4 mos. It is rumored that sales have been made recently at $21, cash, but we think it doubtful. Old Car Wheels still quotable at $19 to $21, 4 mos., with a fair business. No. 1 Railroad Scrap, $24 to $25.

Window Glass.—Business continues fairly active. Some of our manufacturers say that it is better than it was at this time last year. It is about as certain as anything can be, that neither jobbers nor consumers need be apprehensive in regard to buying at the present time, as the cost of production has been reduced to the very lowest notch, and current rates afford little or no margin for profit. Discounts, 70 and 5 for car-load lots and 60 and 20 to 70 for smaller lots.

Coke.—There is more activity, owing, in part, to the resumption of navigation, liberal shipments having been made by river recently, but no improvement in prices, which are unsatisfactory. We continue to quote Connellsville at $2.25 to $2.50 per ton, deliverable free on cars in Pittsburgh.

Coal.—Several towboats, with light tows of coal, left for Cincinnati and Louisville on Monday, and the indications at present are that there will be sufficient water within the next few days to let out the entire fleet. The miners, at a meeting at McKeesport last week, fixed the price for mining at 3 cents per bushel. Whether the operators will agree to pay the price demanded remains to be seen. In some respects the situation is favorable to the miners. Stocks in most of the Western and Southern markets are light and prices have been advanced.

Petroleum.—The refining business continues in a very unsatisfactory condition; prices have declined considerably within the past few days and the raw article is sympathizing, as compared with the highest point within the past 60 days, and has declined 50 to 60 cents per barrel, and refined, 2 to 2½ cents per gallon.

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Nov. 3, write us as follows: PIG IRON.—We have had a very fair demand, and toward the close there is more inquiry for Mill Iron, and prices on this grade are firmer and will range somewhat higher than last reported. The present indications are that next year the product of Hanging Rock Charcoal Iron will be still more reduced. We quote:

HOT-BLAST FOUNDRY.

Hanging Rock No. 1, Charcoal	$23.00 @ .....
Hanging Rock No. 2, Charcoal	21.50 @ 22.00
" No. 1 Coke	23.00 @ 23.50
" No. 2 "	21.00 @ 21.50
" No. 1, Stonecoal	21.00 @ .....
Virginia, No. 1 Coke	22.00 @ .....
" No. 2 "	20.50 @ .....
Ala. and Tenn., No. 1 Charcoal	21.50 @ 22.50
" No. 2 "	20.50 @ .....
Red-short, No. 1 Coke	23.50 @ 24.00
Shawnee No. 1	21.50 @ 22.00
Alice No. 1 ex	23.50 @ .....
Alice No. 1	22.50 @ .....

FORGE IRONS.

Hanging Rock No. 1 Charcoal	21.00 @ .....
Hanging Rock No 1 Coke	19.00 @ 20.00
Virginia, No. 1	19.00 @ 20.00
Ala. and Tenn. No. 1 Charcoal	19.00 @ 20.00
Red-short, No. 1 Coke	21.00 @ 22.00
Cold-short, No. 1 Stonecoal	18.00 @ 19.00

CAR WHEEL AND MALLEABLE.

Hanging Rock	33.50 @ 38.00
Southern and Western Brands	28.00 @ 30.00

ORE.

Virginia Hematite (Washed).....cash.	4.25 @ .....

BOSTON.

Nov. 3.—*Iron.*—Pig has continued in very fair demand, many foundries having hastened their purchases on account of the near close of navigation. We quote: $21.50 for No. 1; $20 to $20.50 for No. 2, and $19.50 to $20 for Gray Forge. *Copper* continues dull and easy, and the total sales in New York have been only 200,000 lbs. Lake at 17¾c., at which the market closes dull. Futures of Lake are quoted at 18c. to 18¼c. For manufactures we quote: New Sheathing, 28c.; Bolts and Braziers, 30c.; Yellow Metal Bolts, 25c. to 25½c.; do. Sheathing, 20c. *Lead* is strong at another slight advance. We quote: Pig, 4⅝c. to 4⅞c., currency. For Domestic Sheet, 8c.; Pipe, 7½c.; Tin-Lined Pipe, 15c.; Bar Lead, 7c.; all of these, excepting Pig, are subject to the usual trade or 10 per cent. discount. *Antimony* is strong at 13c., gold, for Boston spot lots, and *Spelter* is easy, closing at $6 on the spot for 10-ton lots. *Tin* maintains the improved tone. Stocks are not excessive. We quote: Straits, 16c.; Banca, 18½c. to 19c.; Refined English, 15½c. to 16c., gold. We quote Plates: Charcoal, I. C., $7 to $7.25; Coke, $6 to $6.25; and Terne, $6.50 to $7, gold.—*Commercial Bulletin.*

ST. LOUIS.

Specially reported by Messrs. SPOONER & COLLINS, Iron Commission Merchants, 217 North Third street, St. Louis, under date of Nov. 2: Our market is about the same as last report. The demand is still good, though prices remain about the same. We quote same as last:

	No. 1.	No. 2.	Mill.	White and Mot'ld
Missouri Stone Coal....	$22.00	$21.00	$20.00	$19.00
Missouri Charcoal	22.00	21.00	20.00	20.00
Tennessee Charcoal....	22.50	21.00	20.00	19.00
Southern Coke, very soft and strong	23.00	21.00	20.00	18.50
Hanging Rock Charcoal	25.00	24.00	23.00	.....
H. R. Charcoal, Cold-short	24.00	23.00	.....	.....
	Extra No. 1.	No. 1.	B. No. 1.	No. 2.
Hanging Rock Coke....	25.00	24.50	24.00	22.00
West Virginia, Coke...	23.50	23.00	22.00	21.50

COLD-BLAST CHARCOAL—All Numbers.

Hanging Rock	4 mos.	$25.00 @ 38.00
Tennessee	4 mos.	26.00 @ 30.00
Kentucky	4 mos.	26.00 @ 30.00
Missouri	4 mos.	26.00 @ 30.00
Georgia	4 mos.	26.00 @ 30.00
Alabama	4 mos.	26.00 @ 30.00
Assorted Bar Iron		2.00 rates.
No. 1 Railroad		1.00 per h'd
Machinery Scrap "		.80 @ "
Heavy Cast " "		.65 @ "
Light Cast " "		.55 @ "
Old Rails	4 mos.	19.00 @ 20.00
Old Car Wheels	4 mos.	17.00 @ 18.00

CHICAGO.

L. R. HULL & Co., 95 Washington street, under date of Nov. 5, report as follows: There has been only a moderate demand for all grades. Business has fallen off somewhat during the past week. Prices remain unchanged but firm; stocks large. We quote:

LAKE SUPERIOR CHARCOAL

Lake Superior No. 1	$24.00 @ 25.00
" No. 2	23.00 @ 24.00
" No. 3	23.00 @ 24.00
" No. 4 and 5	23.00 @ 25.00

AMERICAN SCOTCH.

Mahoning Valley, No. 1	24.00 @ .....
" No. 2	23.00 @ .....
Shawnee, No. 1	23.00 @ .....
" No. 2	22.00 @ .....
Jackson County, Ohio, No. 1	23.50 @ .....
" " No. 2	22.50 @ .....
Silvery Gray	20.50 @ .....

CLEVELAND.

CLEVELAND, November 6, 1877.

Iron Ore.—There have been a few small sales of Lake Superior ores within the past fortnight at about former quotations, although usually on private terms, and it may be inferred at less than quotations, rather than higher. Furnaces making ordinary grades of Foundry and Mill Irons are using but a very slight proportion of Lake ores, relying upon native ore and mill cin-

der. The receipts from Lake Superior since the advance in Lake freights, which took place about 30 days since, have been very small, so that the surplus on docks reported then has been somewhat decreased.

Pig Iron.—There is now, and has been for 60 days past, a very active trade in Pig Iron of all kinds, particularly for foundry use. Charcoal Iron is moving better than for 3 years past, in small lots, but no large sales are reported. Price is about $25. Foundry Irons range from $20.50 to $23, according to quality and purpose required for. Prices are firm.

Bar Iron and Nails.—Trade in the manufactured article continues to be better than for the early months of the year, and prices are generally maintained. The Nail trade has been favored by the unusually open fall. Stocks in first hands are very low, and jobbers are unable to dictate terms as heretofore.

Scrap Iron and Rails.—The demand grows better each day, and prices have advanced, old Rails being worth to-day $23, and Scrap $23 to $24, net tons.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Nov. 5, write us as follows: Business is not as active as at the same time last month. Prospects are good, however, for a large business this winter. No quotable change in prices. The usual time, 4 months, allowed on quotations below.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23.00 @ 24.00
No. 2 " "	20.00 @ 21.00
No. 1 Southern, Charcoal	20.00 @ 21.00
No. 2 " "	19.00 @ 20.00
No. 1 Hanging Rock, Stonecoal and Coke	20.00 @ 22.00
No. 2 Hanging Rock, Stonecoal and Coke	19.00 @ 20.00
No. 1 Southern, Stonecoal and Coke	19.00 @ 20.00
No. 2 " "	18.00 @ 19.00
"American Scotch"	21.00 @ 22.00
Silver Gray	18.00 @ 19.00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neut'l.	18.50 @ 19.50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18.00 @ 18.50
No. 2 Stonecoal and Coke, Cold-short and Neutral	17.50 @ 18.00
No. 1 Missouri and Indiana Red-short	21.00 @ 22.00
White and Mottled, Cold-short and Neutral	15.00 @ 16.00

CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast	34.00 @ 38.00
Alabama and Georgia, Cold-blast	25.00 @ 33.00
Kentucky, Cold-blast	25.00 @ 33.00

CHATTANOOGA.

Specially reported by S. B. LOWE, Dealer in Metals, under date of Nov. 5: Forge Irons are dull and but few sales are reported. In Foundry Iron, the demand is not supplied by the furnaces, whose production of the foundry grades is limited. Old Rails are firm at quotations, with but few offerings. A sale of 1000 tons is reported at private terms. On Bar Iron, Nails and Fish Bolts the mills are running full time. Prices as a general thing remain unchanged:

COKE.

No. 1 Foundry, extra	$20.00 @ 21.00
No. 1 Foundry	19.00 @ 20.00
No. 2 Foundry	17.00 @ 18.00
Gray Forge	15.00 @ 16.00
White and Mottled	14.00 @ 15.00

HOT-BLAST CHARCOAL.

No. 1 Foundry, extra	20.00 @ 21.00
No. 1 Foundry	19.00 @ 20.00
No. 2 Foundry	17.00 @ 18.00
Gray Forge	16.00 @ 17.00
White and Mottled	15.00 @ .....

COLD-BLAST CHARCOAL.

Car Wheel Metal	22.50 @ 27.50
" extra	24.50 @ 29.50
Forge Metal	17.50 @ 22.50
Muck Bar	29.00 @ 34.00
Old Car Wheels	17.00 @ .....
Old Rails per ton	16.50 @ 17.50
Brown Hematite Ore 50 to 56 per cent. per ton	1.75 @ 2.25
Red Fossiliferous Ore, 50 to 56 per cent. per ton	1.50 @ 1.75

Nails	2½c.	Track Bolts	3c.
Bar Iron	2c.	Trestle Bolts	4c.
R. R. Spikes	2½c.	Ingot Copper	20c.
Light Rails	2¼c.		

W. B. BELKNAP & Co., Iron and Steel Merchants, Louisville, Ky., under date of Nov. 5, report that the demand for Manufactured Iron and heavy Hardware keeps up well and prices are firm. The prediction of *The Iron Age* that the fall trade would be unusually prolonged this year has been justified by the event.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel Merchants, 46 and 48 South Charles street, report us the following prices, under date of Nov. 5: The improvement in trade heretofore noticed continues, and has now assumed quite a marked character. Other than this, the outlook does not present any special features for comment.

AMERICAN REFINED BAR IRONS.

1 to 6 wide by ⅜ to 1 thick; 1 to 4½ wide by 1⅛ to 2 thick	₱ lb 1.95 to 2c.
Round and Square, ordinary sizes from ¾ to 2 inclusive	" 1.95 to 2c.
Hoop iron, 1⅛ wide and upward	" 3 to 3¼c.
Band Iron, from 1¼ to 4 in. wide	" 2¼ to 3c.
Horseshoe Iron ¾ to 1 wide by ⅜ to ½ thick	" 3¼ to 3½c.
Norway Nail Rods	" 5½ to 6c.
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	" 14½ to 15c.
Machinery Steel	" 8 to 9c.
Cast Spring Steel	" 7½ to 8c.
Homogeneous Steel Plate	" 8½ to 9c.
Perkins' Horseshoes, per keg of 100 lbs	$4.02½
" Muleshoes	5.02½
R. R. Spikes	2¼c. to 2½c.
Common Horse Nails per lb	14c. to 18c.

	10	9	8	7	6
Putnam Horse Nails per lb	23	24	25	26	28c.
Globe Horse Nails per lb	23	24	25	26	28c.

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of Nov. 5: The Iron market is without material change, and we continue last quotations, viz.:

Baltimore Charcoal	$29.00 @ 30.00
Virginia	28.00 @ 30.00
Anthracite No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
White and Mottled	15.00 @ 16.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of Nov. 5: There is an active inquiry for Old Rails and Pig Iron at quotations. Our foundrymen and machine shops are very well satisfied with their fall business.

Va. Cold-blast Charcoal, Cold-short	$21.00 @ 25.00
Va. " " Neutral	29.00 @ 31.00
Anthracite, No. 1 X	20.00 @ 21.00
" No. 2 X	19.00 @ 20.00
" No. 2	18.00 @ 19.00
Coke, No. 1 X (West Virginia)	22.00 @ 23.00
" No. 2 X "	21.00 @ 22.00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels)

PARIS, Oct. 21, 1877.—*Metals.*—Although the elections are over, the political situation is not yet clearly defined, and, while this is the case, business in general and the metal trade in particular will remain slack. *Copper.*—The chief increase in the import of Ores into England this year has been in pyrites whose percentage ranges very low. They principally came from Newfoundland and the Peninsula. Taking this low percentage as a basis, the total import of pure Copper into England during the 9 months proves to have been 59,623 tons, against 58,578 tons in 1876, and 68,119 in 1875, while the export of Copper and its manufactures has been 38,377, against 38,815 and 39,718. There has not, therefore, been such a great excess of imports as was generally supposed; yet the tendency of Copper remains downward, most people being shy of it. We have remained quiet here, and nominal at the following rates: First brands Chili Bars, 175 francs the 100 kilos.; current ditto, 172.50; Ingots and Slabs, 182.50; Best Selected, 185; and pure Corocoro Ore, 177.50 for the pure Copper in it. Havre remains tolerably steady as follows: First brands Chili Bars, 175; current ditto, 172.50; and Lota and Urmeneta, 170 to 171. At Marseilles Copper is well held. They quote: Spanish, in Slabs, 165; Red Tokat, 170; small Refined Ingots, 175 to 180; Sheathing, 210; Bolts, 215; and Yellow Metal Sheathing, 205. *Tin.*—The metal trade of Europe having been so long accustomed to see Tin in a disconsolate position, has been slow in making up its mind that the present upward turn is genuine and lasting, if we except London, where the main speculators for a rise seem to be quite sure and confident. The indications are that the upward tendency will make some further headway, since for the time being a great many outstanding contracts have to be filled. Statistically, the outlook is also tolerably reassuring. We have been firmer here, and can record the following advance during the week: On Banca, 2 francs the 100 kilos.; Billiton, 4; Straits, 2.50; Australian, 4; and English, 5. We quote at the close: Banca, 184.50; Billiton, Straits and Australian, 177.50; and English, 176.25. At Marseilles there is also a strong market. They quote, in sympathy with London, Banca, 190 francs the 100 kilos.; Straits, 170; Billiton, 170; and English, 190. *Lead* has been uniformly firm and with an upward tendency generally, both in England and on the Continent. The advance in France has been between 25 and 75c. per 100 kilos. The quotation at Havre is 50.50, and here, 51.25 francs. Our artillery department invites tenders for 400 tons for the 27th instant. Marseilles is steady and quotes First Fusion, 48 to 48.50; second ditto, 47.50; Pipe and Sheet, 51; and Shot, 53. *Spelter* has been supported at most of the metal centers except here, at Paris, where we have given way 50c. per 100 kilos., and quote Silesian, 52; other good brands, 50.50. Havre quotes Silesian 51.50 to 52 francs the 100 kilos. *Iron.*—The week has been devoid of interest. The orders received have been moderate in extent, and prices still remain rather low. But looking upon the general course of Iron matters in France, it must be confessed that of all the Western nations of Europe, we have traversed the critical period of the past four years more creditably perhaps than any of our neighbors. This is due, we believe, in the first place to the little change which our tariff has undergone. Had the Iron interest been as much agitated about the tariff as has been the case in neighboring countries, we should have felt the crisis more severely. Next there has been the great undertaking of the Exhibition and the active demand for all sorts of railroad material. Many Iron works have been transformed into Steel works, and this gradual change has afforded temporary relief to the market. In the Haute-Marne all sorts of Hardware are doing tolerably well. At the North the demand chiefly runs on Merchant Iron and architectural ditto. They get the bulk of their orders from Paris, where in prices we have no change to note. Some large railroad material orders are still spoken of as impending. *Coal.*—The demand for household Coal is active, and prices are sustained. According to the statistics of the port of Marseilles for 1876, the import of Coal through that channel has been, by land and by sea, some 718,000 tons, and the export, 207,000; local consumption took 190,000 tons, and the vessels and manufactures nearly 137,000.

BELGIUM.

(Revue Universelle).

BRUSSELS, Oct. 21, 1877.—*Iron.*—Our producers, always anxious to get orders, are each doing their utmost to obtain some portion of the government commands through adjudication, and in this few have been disappointed, owing to the frequency of adjudications of this sort. The competition is so great, however, that prices are kept depressed in consequence. A very large quantity of old Iron in the shape of condemned railroad material, such as wheels, springs, parts of iron freight cars and locomotives, etc., have been sold for cash by the government under tenders, and the buying has been spirited in the extreme. The general iron outlook presents but little change. Under tenders the manufacturers are ready to sell what they make low, but the moment you approach them privately they ask stiff prices. This seems to us a bad policy, as it will but divert business into the hands of our German neighbors. The Minister of Public Works has a plan, it would seem, of reducing the freight on government lines 50c. per ton on Ores, Iron and Coal, if to be forwarded beyond a distance of 62 miles. Mr. J. Deby has just appeared before the public with his Centennial report upon iron industry in the United States, viewed from a Belgian commercial standpoint. *Coal.*—Much activity is observable in the laying in of winter supplies for domestic use, but this does not induce our producers to accelerate overmuch their output, thus allowing stocks accumulated during summer to be reduced by degrees. Prices, nevertheless, do not improve. Since Aug. 23 Coal is allowed to enter Montevideo duty free, but another direct tax is none the less levied on it on the basis of value of $10 per ton; this tax is called the capital tax.

GERMANY.

Borsenhalle).

HAMBURG, Oct. 20, 1877.—*Metals.*—Business in metals, though still quiet so far as the supplying of local consumption is concerned, has been looking up as regards our export trade to Russia. The latter country is now making superhuman efforts to place its entire colossal forces in the field; and this is calling forth extraordinary exertions in order to equip these fresh hundreds of thousands fully during the ensuing four months, requiring for that purpose an enormous amount of metals of all sorts. Although Russia produces most metals, and has machine shops of the very best kind in abundance, neighboring countries have to be drawn upon in order to hasten the gigantic armament. *Copper.*—The German markets have been quiet and flat, although prices have been nominally sustained. At Berlin good qualities English and Australian are worth 75 to 78 marks the 50 kilos., and Mansfield 78.50 to 79. Here and at Stettin there is no change to be noted. *Tin* has looked up somewhat in sympathy with the improved statistical aspect and the upward turn in England and Holland. Berlin now quotes Banca 72.50 to 73 marks the 50 kilos., and English 71.50 to 72 marks. No alteration to report from here and Stettin. *Lead.*—Great firmness has signalized the German markets, but the week's dealings have not amounted to much. Berlin fluctuates between 21.20 and 21.50 marks the 50 kilos., while here we have remained unaltered and so has Stettin. *Spelter.*—Although the general feeling as regards this metal is rather a better one, we have relapsed into dullness in Germany with respect to it, due, we should say, to the season only. Berlin is inactive at 19.50 to 20.25 marks the 50 kilos., while neither here nor at Breslau and at Stettin has there transpired anything worth reporting, prices remaining the same as before.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Oct. 23, 1877.—*Tin.*—During the week under review Tin has been tolerably firm, although the dealings have been moderate in extent. Banca is bringing 51 guilders the 50 kilos, and at this figure there are more buyers, but holders are at the close asking 41.25. In Billiton Tin some business has been done at 40 to 40.25, both on the spot and for November delivery.

EAST INDIES.

(Gilfillan, Wood & Co.)

SINGAPORE, Sept. 22, 1877.—*Tin* keeps wonderfully steady in price, and this is chiefly due to a restricted supply, which is just enough for the present limited American and China demand. There can be no question that prices are telling on production. To-day's price is $19.37½ per picul. *Tonnage* is still very plentiful, and rates are easy at 27/6 per ton for dead weight. The Queen of the Seas, for New York, is the only vessel loading for America. *Exchange* on London is 3/11¼ per dollar, 6 months' sight credit.

(Dummler & Co.)

BATAVIA, Java, Sept. 10, 1877.—*Metals.*—In *Iron* there is no business of any consequence to note, and the market is well supplied. *Copper Sheathing*—A few sales are reported of Dutch and English at 75 guilders and 73.50 respectively. *Tin.*—According to official returns the stock of tin at Banca amounted to 66,754 piculs on March 31, 1877, since when there have been added during the second quarter, to July 1, 3163, while there have been shipped this way 9210, leaving a stock July 1 of 60,707 piculs. *Tonnage.*—The demand continuing limited, with a still considerable amount of disengaged tonnage, rates have further given way. Freights have now reached a point which few vessels are inclined to accept, and settlements have in consequence been in a smaller scale than usual at this season

(J. Peet & Co.)

BATAVIA, Java, Sept. 10, 1877.—*Tin.*—The average of the August sale of Billiton was 42.32 guilders per picul. The next sale will take place on Monday, Oct. 8, and will comprise about 10,000 piculs. *Coal.*—Australian has been sold at 10 to 13.50 guilders per ton, and English West Hartley at 16; there is little or no demand. *Exchange* has from 11.87½ advanced to 12 guilders per £.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., Oct. 22, 1877.

TRADE NEWS

is somewhat at a premium just now, for the course of commercial events runs along so sluggishly that it is only now and then we get a ripple of interest, and still more rarely one provocative of excitement. It is, consequently, in times such as these that the minutiæ of business, the apparently less weighty matters, and the smallest details require the most careful observance, not only on the part of those who are really engaged in any particular trade, but also by those, such as myself, whose business it is to acquire and disseminate accurate information for the benefit of others. It is quite certain that to keep level with the progress of the times it is necessary for every ironmaster and manufacturer to read the best metallurgical and trade publications he can obtain. Such information is absolutely vital for him, and no man who neglects this branch of "educational commerce" need nowadays hope to attain eminence in his especial line. In pursuance of this theory, I find that I have this week no great item of intelligence, but a number of smaller matters which I can only hope to conglomerate or, at all events, mix up in a palatable sort of *olla podrida*.

LAST WEEK'S GALE,

to which I briefly alluded in my letter of Oct. 15, was of a most destructive character and raged from the Land's End in Cornwall up to John O'Groat's, doing an incalculable amount of damage all over the country. It is roughly estimated that some hundreds of thousands of trees were uprooted, an immense quantity of farm produce blown away, houses unroofed, manufactories and workshops blown down, and, worst of all, there was serious loss of life in several places, owing to the falling of buildings and large chimneys. Within the past few days

AN IMPORTANT RAILWAY PROJECT

has been announced, being no other than the absorption of the Manchester, Sheffield and Lincolnshire lines by the Great Northern and the Midland, who will, it is said, guarantee the ordinary shareholders 2½ per cent. for 1877, and increase by ½ per cent. per annum up to 1881, when 4½ per cent. will have been reached, and that to be paid thereafter in perpetuity. It is probable, however, that the other great companies will most strenuously contest the carrying out of this formidable plan.

THE LABOR MARKET

is not as yet in that pacific state which capitalists would like to see, but there are no disputes of any real magnitude on hand except at Oldham, Bolton and in some branches of the building trade. At Manchester the strikers have issued huge posting bills to all the large towns, urging all carpenters and joiners to keep away during the strike, and condemning the "misrepresentations" of the employers and their importation of American workmen. At Wolverhampton, too, there was an indignation meeting on Saturday night against the introduction of German carpenters, &c., into that town, the speakers being Messrs. Thos. Holliday, J. D. Prior and R. Juggins, and resolutions condemning the importation were passed. At Oldham and Bolton the cotton trade disputes are producing very sad results, and a similar state of things is likely to come about at Preston. On the Clyde a number of iron shipbuilders were locked out this morning. At Portsmouth dockyard 300 men are to be discharged. The Irish railway strikes may now be regarded as settled. At Forest Vale Ironworks, in the Forest of Dean, the forgemen on Saturday received notices terminating contracts, prior to a 5 per cent. reduction.

THE LONDON MASONS' STRIKE,

however, has now proved more serious than any of the above, and is likely to have further and more alarming results. Last week 26 masons from Germany and 24 from Italy were brought to the metropolis and were set to work on the new law courts on Friday morning. When they left on Friday evening they were set upon by a mob of "roughs" who hooted, hissed and "jostled" them. On Saturday morning the Italians were not forthcoming until an escort of police was sent for their protection. They are now to be provided with temporary quarters within the new buildings. The London masons' "strike committee" deny all knowledge of this intimidation, but, speaking from some years' close observation of trade union proceedings, I should say they "protest too much."

THE GERMAN TRADE

for the first half year of 1877 is set forth by the following statistics of the imports and exports, just issued by the government department in charge thereof. They show that the pig and ore imported was 5,307,008 cwt. (against 5,271,959 cwt. imported in the first half year of 1876); merchant irons, 2,277,314 cwt. (against 699,635 cwt.); engines and machinery, 368,630 cwt. (against 206,354 cwt). The exports were, in cwts.: Pig iron and ores, 3,256,851 (2,962,490 in 1876); merchant irons, 4,381,704 (2,644,512 in 1876); machinery, 381,764 (372,452 in 1876). The totals are: Imports, 8,052,952 cwt. (against 6,271,248 cwt.); exports, 8,020,319 cwt. (against 5,979,454 cwt). Ores show an increase of 2,000,000 cwt. in imports against last year, but a decrease of 1,000,000 cwt. in the exports. The importation of pig iron has remained unchanged. Separating the weight of pig iron from that of the ore, we have (in cwts.):

	Imports.		Exports.	
	1877.	1876.	1877.	1876.
Ores	3,331,258	1,314,462	6,201,217	7,177,634
Pig-iron	5,159,323	5,147,907	3,103,014	2,802,718
Scrap	147,685	124,052	153,837	159,772
Total	5,307,008	5,271,959	3,256,851	2,962,490

GENERAL GRANT AT BIRMINGHAM

again has occasion to explain his protectionist views, in reply to an effective address by Mr. Joseph Chamberlain, M. P., who was, until recently, the leading partner of Nettlefold & Chamberlain's screw firm, and who is now regarded as the leading Radical politician of this country. In the course of his speech Mr. Chamberlain remarked: "Trade had fallen off lately under the depression which was universal, but in 1875 the imports and exports together amounted to nearly 2¼ times as much as 20 years before. That was the bright side of the picture, but, unfortunately, the increase was entirely on one side. The imports had gone up, while the exports had come down. They had enormously extended their purchases, but their sales were in nothing like the same proportion. It was natural that this state of things had given rise to much discontent, for the General even heard of it during his visit to some of the Birmingham manufactories. Some persons—but a few he confessed—talked of going back to protect themselves from such a state of things, a theory which no sensible man or responsible statesman would indorse. They had extended free trade because they believed it was good for them. They believed that in the long run it would be to the interests of all to be able to buy in the cheapest market." The General drily and somewhat anomalously replied, *inter alia*, "Now there is one subject that has been referred to here that I do not know that I shall refer to, and that is the great advantages that would accrue to the United States if free trade would only be established. I have a sort of recollection of reading that England herself had a protective tariff until she had her manufactures established. I think we are rapidly progressing in the way of our manufactories. I believe we are becoming one of the greatest free-trade nations on the face of the earth. When we both get to be free traders, I think it is probable all other nations had better stand aside, and not contend with us at all." I suppose the "laughter and cheers" were more at the General's manner than his matter. Apart from this, the addresses, &c., were purely political, for Birmingham is a terrible manufactory of all that kind of explosive.

LAST WEEK'S FIRES

were numerous and of serious proportions, but I have not space to give more than a mere list, thus: John Gleng & Co.'s Glengowan Print Works, Airdrie, damage, £15,000; Mr. Lowan's cotton mill at Burnley, damage, £20,000; Southern's timber yard, Manchester, damage, £12,000, and Reynor Bros.'s cotton mill, Ashton, damage, £40,000. Once a cotton mill takes fire it is doomed.

CONTINENTAL RAIL CONTRACTS

just now appear to be going to Belgium and France. One of 2400 tons of steel rails for the North Belgian Co. has gone to the Augleur & Schlessin Cies. The same company has just sold 5000 tons of old rails at £2. 10/7, and 2000 tons at £3. 10/. A syndicate of French manufacturers is said to have contracted to supply the Roumanian railways with 40,000 tons in ten years at £7. 4/, delivered at Galatz. The syndicate is bound by the contract to take back one ton of old rails for each ton of new at £2. 16/ per ton. The Orleans line of France will open tenders for 10,000 tons of rails tomorrow. From South America we hear that two important new lines are likely to be commenced shortly, the contracts having been placed with Clark & Co., of London.

VARIOUS LARGE UNDERTAKINGS

in this country are also spoken of. Manchester has in contemplation a tramway scheme which will involve the construction of 40 miles of line, to cost £130,000. Liverpool is about to get its water supplied from North Wales at a cost of £1,250,000, and also contemplates the construction of a huge high level bridge over the docks and across the river, besides a new float on the Liverpool side.

SCOTCH PIG IRON

has been very quiet and prices have generally become weaker. During the week 701 tons of pig iron went into Connal's stores, where there are now 163,612 tons, against 94,206 to same date of last year. There were 6230 tons of Cleveland pig imported into Scotland *via* Grangemouth last week, while of the total Scotch shipments undernoted, 6783 tons went foreign and 2667 coastwise. Freights unchanged.

James Watson & Co. (Glasgow, Oct. 19) say: There has been a continuance during the past week of the quiet feeling reported in our last, and the price of warrants has receded from 53/ to 52/7½, the latter figure being accepted yesterday. This afternoon the tone is rather better, and the market closes, buyers, 52/9, cash, and 53/, 1 month. Shipments last week were 9455 tons, against 11,049 tons in the corresponding week of 1876. We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	54/ 6	51/ 6
Gartsherrie, "	60/ 6	54/
Coltness, "	65/ 6	54/ 6
Summerlee, "	60/	53/ 6
Langloan, "	63/	54/ 6
Carnbroe, "	56/	52/ 6
Calder, at Port Dundas	60/	52/
Glengarnock, at Ardrossan	59/	53/ 6
Eglinton, "	54/ 6	51/ 6
Dalmellington, "	54/ 6	51/ 6
Shotts, at Leith	62/	56/
Kinneil, at Bo'ness	56/	52/

Messrs. Wm. Colvin & Co.'s prices are similar.

The prices current of John E. Swan & Bros. (Limited) include these:

Gartsherrie, No. 1	60/
Coltness, "	66/
Glengarnock, "	58/6
Eglinton, "	54/
Ballast pig iron, alongside	43/6

Last week's shipments from the Clyde included a steam launch for Rangoon, £23,000 worth of machinery for Rangoon and Rouen, £5000 of castings for New Zealand, £1000 pipes and tubes and £7000 miscellaneous iron, &c.

A REMARKABLE SPEECH

on "Protection and Free Trade" was delivered at Cambridge University on Saturday evening by Professor Fawcett, one of the greatest living authorities on political economy. In the course of his address he said: "It should be remembered that the adoption of free trade in England was powerfully promoted by circumstances of a purely exceptional character, which did not now exist in any country where protection was maintained or proposed. There was, moreover, this fundamental difference, that whereas in England it was agricultural produce that was more carefully protected, it was the home manufacturing industry that was, on the Continent, in America and in the colonies, at present most jealously shielded against foreign competition. Protection in England made bread dear, but this could not be urged against Australia or America. The opposition to free trade was to a considerable extent promoted by modes of thought very analogous to those which often induced workmen employed in some special trade to resist the introduction of a new machine. Conclusive facts might be adduced proving that industries were ultimately injured by protection; and the Professor declared that, while considering and giving their due weight to the arguments in favor of protection, he did not wish to be understood as in the slightest degree advocating the system or palliating the mischief it produced. We were, perhaps, in England prone to overstate the results of free trade. Other causes had concurrently operated in promoting the wonderful growth of our prosperity. A country might, too, be so favorably circumstanced that protection might be powerless to arrest, although it might impede, its progress. Protection had always and must always exercise an impeding influence, and, however great a country's prosperity under protection, that country would enjoy greater prosperity if its capital and labor, untrammeled by artificial restrictions, were freely permitted to be directed to those industries where they could be employed with maximum efficiency." Now, reading "between the lines," I should infer that the United States is "a country so favorably circumstanced, &c., &c." Is it not so?

TRADES OF SHEFFIELD.

Judging from the current reports of those actually engaged in the various branches of the local iron trade, it would appear almost certain that there is no particular improvement, and that in many respects prospects are by no means of a hopeful nature; yet, on the other hand, I am told on the best possible authority that the local railway traffic is decidedly better, and that almost all kinds of consignments are on a larger scale than for some months past. From this latter evidence it would almost appear that there is an improvement in the aggregate production of the town and district, although the experience of individual manufacturers in these branches does not tend to afford proof of the fact. It is, at any rate, certain that there is no alteration for the better in respect of pig iron, which remains quiet and steady at the slight decline of prices alluded to in my last week's communication.

During the present week a few sales in Derbyshire foundry numbers have taken place, but there is so much irregularity in actual transactions, that the price at which each is closed is in most cases known only to the buyer and seller. It seems, however, that purchasers of large lots are enabled to make rather better terms with the smelters than a month ago, owing to the very heavy stocks held in various parts of the country, and to the general gloom which overhangs the trade generally. At the present juncture very little pig from Lincolnshire is coming into this immediate neighborhood, albeit some few parcels of it are being taken by firms near Barnsley, and in the West Yorkshire district. Hematite sorts are in good request, and are being sold steadily at full recent quotations, as detailed in the price lists.

In finished iron there has been rather more business done during the week, a fact which may be attributed to the purchases which are usually made at the beginning of the quarter. These have mostly been in respect of bars, sheets, hoops and plates, the former of medium quality, being held at £7. 10 to £8, sheets at £9. 10/ to £10, hoops at £9 to £10, and common plates at £7 to £8. Edge-tool irons for the use of the Sheffield manufacturers of that ilk are selling at £10 to £10. 10/, but nothing in any bulk. Best North Staffordshire bars for steel converting purposes run from £8 to £9. 10/, but the dullness of the cast steel trade has lately caused the sales to be very small, a remark which, in a less degree, has equal application to foreign irons, of which Swedish and Russian have long had the local preference. Swedish is to be had at prices varying from £15 to £19. 10/, according to brand, and Russian at £18 to £23—the latter being mostly used up for saw and file steel. It is also understood that capital bars for similar uses are coming here from the Cleveland district, where they are being produced by the Danks process. Allusion having been made in other quarters to the fact that some of the Russian orders for corrugated iron sheets for winter quarters in Bulgaria have come here, I may be allowed to state that, so far as I have been enabled to ascertain, no such orders have been placed in this district, and, further, that the bulk of the work has been taken by the Jean Cockerill Cie., Belgium. There is a fairly good demand for machinery of various kinds for sundry continental and colonial countries, the latter being among the largest and best customers we have. I am informed, for instance, on capital authority, that since the close of the Cape Exhibition, one Sheffield firm has received orders for and has dispatched over £50,000 of machinery to that colony alone. This fact should prove that it is, after all, worth

while sending exhibits to distant exhibitions. I am, therefore, glad to hear that Sheffield will be worthily represented both at next year's Paris and Australian Exhibitions. The latter market is especially worthy of careful attention and cultivation, both for itself and the New Zealand trade which is carried on through its ports.

The cast steel departments are not busy, but the incoming of the quarter has also been of benefit to it. Ordinary tool steel for Sheffield, Birmingham, Wolverhampton, Lancashire, Leeds and Scotland is selling fairly well, and sheets for the Birmingham pen makers and the American clock manufacturers are in better request. From Italy, Germany and France we are getting steady favors, and the United States market appears to be rather stronger, especially for steel of very fine quality—such as razor and special tool steels. I hear of one well-known house having received a good American order for these last-named brands this week. The political state of France is, however, causing so much local uneasiness that some firms have, to my own knowledge, written their customers pressing for an immediate settlement of accounts. The Bessemer works remain active and are fairly engaged for some time ahead. The coal market remains fairly active in all directions, particularly in respect of house coal, which is, consequently, a little firmer in price. The tonnage sent to London last month was considerably in excess of the quantity forwarded in August, the Midland having carried 150,191 tons, the London and Northwestern, 73,301, the Great Northern, 78,301, and the Great Eastern, 46,305 tons. The Midland increase of nearly 30,000 tons was from the Derbyshire pits—Claycross, Tibbshelf, Grassmoor, &c.

On Tuesday, between 400 and 500 miners employed at the Drift Pitt, Thorncliffe, belonging to Newton, Chambers & Co., came out on strike against the introduction of a new benzoline lamp, but have since agreed to give it a fortnight's trial. The Barnsley seam of coal, 8 feet in thickness, has just been won at the Wath Main Colliery, one of the largest of the new local undertakings of the kind. The shafts are 345 yards deep, and each 14 feet in diameter. When in full going order 1000 tons daily will be produced.

On Wednesday, the foundation stone of the new Stephenson Memorial Hall was laid at Chesterfield by the Marquis of Hartington, with a good deal of attendant ceremony. It will be generally remembered that George Stephenson, of whose career and achievements nothing need be said here, spent the latter part of his life at Chesterfield, and his remains lie in the Trinity churchyard of that town. The hall is to be used in connection with the Chesterfield and Derbyshire Institute of Engineers, and for various local educational purposes. It will be Gothic in design, from the plans of a Manchester architect, and will cost about £13,000.

A circular to the shareholders of the Industrial Coal and Iron Company has been issued by Mr. Thomas Nicholson, stating that he has arranged to buy out the mortgages of the Storforth Lane Colliery of the company, on terms specifically named. The vigorous working of this and the Woodhouse Colliery of the company, is also advocated in the circular.

In the Cutlery branches there is a fair business doing, especially by such houses as J Rodgers & Sons, Harrison Bros and Howson and George Wostenholm & Son. Special goods, such as shoe and butchers' knives, are selling very well for the United States.

ANOTHER EXHIBITION AT THE CAPE

is, we are told to-day, to be opened at Cape Town in April next. It is set forth that Mr. Edmund Johnson, of 3 Castle street, Holborn, London, is the authorized delegate for Europe; that all goods should be shipped, if from London, not later than February, 1878, and that special attention will be given to the show of agricultural implements which will be held in the grounds of the exhibition. Here, and at Stockholm, is a chance for your manufacturers.

THE INDIAN GOVERNMENT SHIPMENTS

have been so disposed of as to have excited much keen criticism from the London and Liverpool shippers. During October and November about 36,000 tons of rails, sleepers and other materials had to be sent off to Bombay, but it is alleged that the India Office, instead of advertising in the usual manner, sent out a "confidential" circular, and at length entrusted the order to a London firm of shipbrokers having no vessels of its own. This firm had to seek for the necessary tonnage—a state of things which the shippers allege to be not only anomalous, but savoring of jobbery.

STAFFORDSHIRE AND BIRMINGHAM.

In the iron trade of South Staffordshire there is no change for the better in any branch, particularly in respect of common iron, which is selling at very low figures. Some of the producers of superior brands are moderately well engaged, but the demand is chiefly on home account, with a *soupçon* of colonial orders. Best bars are quiet on the basis of £8. 10/, with £7 to £7. 10/ for sheets, £8 to £9 for bars, and £7 to £8 for hoops. Common bars are obtainable at anything just on either side of £6. Sheets, both galvanized and plain, are said to be inquired for on Australian, New Zealand and South American account. In some of the hardware branches the previously reported slight improvement appears to be tolerably well maintained, particularly as regards the tube, gas-fitting, hollowware, edge tools, implement and certain light engineering branches. Plated goods and some sorts of jewelry are also selling rather more freely, as also are brass and iron bedsteads. In various kinds of wire prices have been lowered during the week, varying from 6d. per bundle to 15/ per ton. Warrington (Lancashire) best iron wire, bright and galvanized No. 0 to 6 is lowered 6d. per bundle; prepared bright and galvanized fencing wire is down 10/; rolled fencing, 5/6; fencing staples, 6d. per cwt.; steel spring wire, 6d. per bundle, and best drawn galvanized telegraph wire, 10 6 per ton. The Warrington figures are now £10. 5/ for annealed fencing wire to 0 to 6 gauge; bright to 6 gauge, £12; galvanized drawn to same, £14. 5/; bright steel, £14; rolled fencing wire, to 4 gauge, black, £8; galvanized, £11. 15; galvanized strand of 3 wires, 0, 17/9; 3, 19/3; 5, 20 3; of 7 wires, No. 1, 19/6; No. 2, 20/; No. 3, 20/6; No. 4, 22/; No. 5, 22/9; No. 6, 23/9; best best draw telegraph wire to No. 6, £16; 7 and 8, best £17, all per ton, delivered in Liverpool.

SOUTH WALES AND MONMOUTHSHIRE.

A new dock capable of shipping 6,000,000 tons of coal annually is likely to be constructed by the Taff Vale and Senarth railway companies at Cardiff, and another with a capacity of 1,500,000 tons by the Glamorgan canal trustees. Lord Bute is also to be pressed to push on with his new dock, which will cost £2,000,000 sterling. Last week's shipments were 100,000 tons of coal and patent fuel. The iron and steel trades remain quiet, although at Panteg, Rhymney, Dowlais, Blænavon, Ebbw Vale and Tredegar steel rails are being made. Briton Ferry works are likely to be stopped for the winter. Sheets are also in demand from Bookers' works, and hematite pigs from the Treforest establishment. Tin plates remain quiet as to demand, but moderately steady in respect of prices.

UNITED STATES MANUFACTURES

are now beginning to be "complained about" in some of the South American markets, particularly in Mexico, Brazil and the Argentine Republic. In proof of this the following quotation from an American metal broker's circular is published: "The importation of iron and manufactures of iron to this country is now one of the things of the past. Orders are now coming in from nearly every foreign country for American agricultural implements, tools of all kinds, locomotives and railway cars; and at the present prices of steel rails, and our unexcelled facilities for supplying them, it is not improbable that ere long our exports of such will form a considerable item. Already considerable quantities are in negotiation."

THE METAL MARKETS

have been quiet in most respects, the notable exception having been tin, in which a considerable business has been transacted.

Messrs. Von Dadelzen & North say: "*Copper* has been dull, and Chili bars are rather easier, with sellers of G. O. B. at £66; named to best brands have been sold at from £66. 5/ to £67. 10/. The charters for first half October are telegraphed as 1600 tons. Little doing in Australian. Wallaroo is quoted £80, and Burra, £74. 5/ to £74. 10/. English is quoted £71 to £72 for tough, £72. 10/ to £73. 10/ for best select, and £77 for strong sheets. At the Swansea ticketing on Tuesday the average produce was only 6⅝. No Cape ore being in sale, and the average price was 11/ per unit. *Tin.*—A good business has been done in Australian at steady prices, £68 for spot parcels, and £68. 5/ to £68. 10/ for forward delivery. About 50 tons Straits have changed hands at £68. 5/. The Dutch market is easier. Banca quoted 41¼fl., and Billiton, 41¼fl. The Billiton sale in Java realized an average of 42 32-100fl. per picul, or 39fl. per 50 kilos., or about £65 in Holland. English tin is rather easier, though quotations remain at £73 to £74 for ingots, and £74 to £75 for bars. *Tin Plates* easier. *Lead* is dull, and English pig quoted £20. 2/6 to £20. 5/. Soft Spanish, without silver, £19. 15/. *Spelter* stronger, at £19. 10/ for ordinary brands. *Quicksilver* steady, at £7. 15/ for Spanish. *Antimony*, £48."

The *Mining Journal* remarks: "The markets abroad are all well supplied, and there is no room for speculation. Great caution is necessary in regard to purchasing and giving credit. No risks of a doubtful character should be taken, or contracts entered into extending over any lengthened period, without good deposits. This is not the time for extraordinary operations, and it would be better to confine transactions to absolute requirements, and not to indulge in any speculation; those who do will assuredly lose their money. *Copper.*—At the Swansea Ticketings, last Tuesday, copper ores realized 11/ per unit for 6⅝ per cent. of produce. This is the lowest price reached for very many years, and the smelters have at last succeeded in buying cheaply, so that it ought to enable them to recoup some of their former losses, and at the same time to sell manufactured at a good profit even below present quotations, which it is said they can very well afford to do, for they are undoubtedly great gainers by the reduced price of ores. *Lead.*—The market keeps fairly steady, but the demand is quiet. *Quicksilver.*—There is little to report in this metal, the price having remained at £7. 15/ all the week, with only small sales. Californian is likewise unchanged at 45c. *Tin Plates.*—Orders are falling off here, and sellers are not indisposed to make a trifling concession. *Steel.*—German keg and faggot is in fair request, but English keeps very dull. In Sheffield the trade is represented as duller than ever, and that nearly half the cast steel furnaces are lighted."

London Metal Exchange official report: "*Copper.*—Particulars of the charters advised are 1150 tons bars and ingots for England, and 450 tons bars for the continent; market quiet. G. O. B. Chili bars, £65. 15/ to £66; Wallaroo, £80; Burra, £74. 10/; English tough, £71 to £72. Best selected, £72 to £73. 10/; strong sheets, £77. *Tin*, quiet; a small business in Australian at £68; Straits quoted at £68 to £68. 5/; English ingots, £73. *Scotch Pig Iron*, 52/8 to 52 9; *English Pig Lead*, £20 to £20. 5/; soft Spanish, £19. 15/. *Spelter*, £19. 5/ to £19. 10/ for ordinary brands. *Quicksilver*, £7. 12/6 to £7. 15/. *Antimony*, £48."

Latest Liverpool prices are:

Iron, f. o. b. in Liverpool, per ton.

	£	s.	d.		£	s.	d.
Merchant bar	6	0	0	to	6	10	0
" in Wales	5	10	0	to	6	0	0
Staffordshire	7	0	0	to	9	5	0
Hoop	7	10	0	to	8	10	0
Sheet	8	10	0	to	9	10	0
Nail rod	7	0	0	to	7	10	0
Bar, best crown	7	0	0	to	8	0	0
Boiler plates	9	0	0	to	10	0	0

Tin Plates, f. o. b. in Liverpool, per box.

	£.	s.	d.		£	s.	d.
Charcoal, I. C	1	1	6	to	1	3	6
Coke, I. C	0	17	6	to	0	19	6

Copper, delivered in Liverpool, per ton.

	£	s.	d.		£	s.	d.
Bolt and sheathing	82	0	0	to	0	0	0
Tile	75	0	0	to	0	0	0
Tough cake	76	0	0	to	0	0	0
Best selected	77	0	0	to	0	0	0

[*Continued from page* 19.]

INDUSTRIAL ITEMS.

PHILADELPHIA.

H. C. Frick, of Broadford, is running all his coke interests at full capacity, and is shipping upward of 40 cars of coke per day. We believe he is the heaviest coke manufacturer in Pennsylvania.

Hutchinson & Bro. are now running their ovens on half time, but expected to resume full time by the 1st of the month.

The mines and ovens of J. L. Sherrick & Markle are being worked to their full capacity.

The Oliphant furnace is turning out some 12 tons of very superior iron daily, and judging from the large shipments being constantly made, it finds a ready market. These works, owned by Mr. F. H. Oliphant, give employment to nearly a hundred persons.

Hopewell Furnace, owned by Clingan & Buckley, some time ago went out of blast, and it is not known when operations will be again resumed there.

The Harrisburg car manufactory has accepted an order from the New York Central Railroad Company for 100 new box cars. The blacksmiths of the works have commenced work on a new order.

A ten-ton heat, the largest ever known in the United States, was made in the Baldwin Steel Works a short time since.

Spang, Chalfant & Co. are building a new addition to their new pipe mill, which is to be 130 feet.

Clark, Reeves & Co. have just completed an iron truss bridge, two spans, of 100 and 150 feet respectively, for the New London and Northern Connecticut Railroad. Also a two span iron bridge, 313 feet in length, for the Wabash Railroad Company, over the Wabash River, in Indiana. They are also now ready to ship an iron bridge, 100 feet in length, to Cuba for the Caibarien and St. Espiritus Railway Co. It was built under the supervision of a Cuban engineer, who will oversee its placement.

The contracts with the Phœnix Iron Company, the Keystone Bridge Company, and the Edgemoor Iron Works for the construction of three sections, one mile each in length, for the Gilbert Elevated Railway of New York city, have been signed, but the order to commence the work has not been given, owing to some legal dispute, which is likely to be arranged immediately.

PITTSBURGH AND VICINITY.

A mass meeting of coal miners was held at Rock Run, near McKeesport, on the 2d, at which resolutions were adopted condemning the course of the miners at Brown's works in working for less than three cents a bushel. But before the meeting adjourned information was received that Brown's men had "struck" and resolved not to resume work for less than three cents, whereupon the condemnatory resolutions were rescinded. It was determined to hold mass meetings on Wednesday, of the miners of Pools Nos. 1 and 2 at Demlar, and of the miners of Pools Nos. 3 and 4, at Brown's Black Diamond Works, where the men are working for less than three cents.

The Soho Furnace which blew in on the 22d ult. is doing finely, the start being the best ever made. The bosh has been increased from 18 to 18½ feet, and other improvements have made it virtually a new furnace.

The U. S. Iron and Tin Plate Co. have struck gas at their works near McKeesport.

At the trustee's sale, $21,000 was bid for the Escanaba Furnace Company's property, when Mr. J. R. McCune, the trustee, withdrew it. Two months ago the property was sold to a Chicago man for $91,000, but the purchaser was unable to comply with the conditions of the sale.

Mr. D. W. C. Carroll, builder of Captain Ead's monster dredge boat, Bayley, reports the vessel as working in a most satisfactory manner. The speed attained, with two fuel boats in tow, averaged 10 miles per hour. Mr. Carroll states that he had quite a number of inquiries from steam boatmen in regard to the cost of constructing iron hull cotton-boats, and expects to open negotiations with parties next week.

Ground has been broken for the erection of an additional furnace at the Tumbler Works. The company were obliged to commence this furnace, as they are unable to fill all their orders. When completed, this will probably be the largest tumbler works in the United States. They will have a capacity of turning out 50,000 tumblers per day.

The Cambria Iron Company has obtained the contract for furnishing the rails for the extension of the Castle Shannon narrow gauge railroad.

W. D. Wood & Co., are fitting up another stationary engine, to be placed in the polishing mill. They intend enlarging their forge department.

WEST VIRGINIA.

Most of the Wheeling Mills got off large quantities of nails during the late rise in the Ohio.

OHIO.

Fifty thousand hoop-poles have been cut on the Hecla Furnace lands, and the Monitor casting house is full of tan bark. That's what furnaces have come down to.

Brown, Bennett & Co. are to connect their home office at Youngstown with Cleveland by telephone.

Both blast furnaces of the Cleveland Rolling Mill Company gave out week before last. They have been blown out, and workmen are and will continue actively engaged day and night until they have been put in thorough repair and are again ready for blast.

The *Warren Record* says: A rumor being current to the effect that Brown, Bonnell & Co., of Youngstown, had offered to lease and run for ten years the Richards Furnace and rolling mill, on simply paying the taxes, we made inquiry of one of the trustees and were informed that no proposition of that kind had been made; a Cleveland party have been negotiating, but nothing definite has transpired.

The Alice Furnace, Ironton, which was compelled to bank up for want of coke, is again in operation.

Messrs. Geo. F. Eberhard & Co., of Canton, make specialties of light machinery, general hardware, wood and metal patterns and models, malleable iron, brass and composition castings, plating, galvanizing, etc. They offer inventors many advantages for cheaply putting into shape and producing inventions, especially those requiring malleable gray iron, and brass and composition castings.

Messrs. Thomas, Son & Co., machinists, Cincinnati, have just shipped three very fine machine tools to Evans, Dalzell & Co., Pittsburgh, Pa., one is a forming machine with steel rolls, one a break for sheet metal, and the other a corrugating machine of a new and improved pattern, intended to be used in the manufacture of metal kegs and cans. The kegs, when made upon this machine, have the appearance of ordinary kegs, the corrugations resembling hoops. This firm have turned out a number of very fine metal working machines, some of which are very heavy.

Mr. Thos. S. Brown, B. F. Paddock, and G. A. Gray, Jr., about the 1st of July last, formed a co-partnership for the purpose of dealing in pig iron. Mr. Brown is well known in the business community of Cincinnati, having been in the iron business for a number of years in connection with Mr. Thos. E. Smith. Mr. Paddock is an old and well-known hardware merchant of Cincinnati. Mr. Gray has been connected for several years with the Niles Tool Works, and has the advantage of a large circle of business friends as well as a knowledge of the wants of consumers of iron. They have their office at No. 36 West Fourth street, Cincinnati.

Mr. Wm. Donaldson, machinist and manufacturer of light lathes, has just shipped one of his new lathes to the Bullard Machine Co., Dey street, New York.

MICHIGAN.

The following shows the total shipments of ore from the district for the season up to October 24, together with those of a corresponding period last year:

From where.	1876.	1877.
From Marquette	421,733	494,166
From Escanaba	325,985	337,456
From L'Anse	79,988	54,422
Total	827,706	886,044

Showing an increase of 58,338 gross tons. —*Mining Journal.*

The manganiferous ore found at the McComber Mine, and of which 4000 or 5000 tons will have been shipped at the close of the season, brings an advance of $1.25 per ton over the other hematite ores, and is much sought after by furnacemen. It is believed that 10,000 tons of this ore can be mined next year.

The Menominee Furnace, which has been banked up for the past month, will be blown out, and probably remain idle during the winter. The company have filed a petition in bankruptcy, and it is not likely that the furnace will be blown in again before passing into other hands.

H. D. Smith, Esq., has purchased the stock of ore and fuel on hand at the National Furnace, Dupere, and taken a lease of the furnace, which he will operate, at least until all the stock is used up.

MISSOURI.

The Missouri Furnace Company, of Carondelet, are preparing to start up again, encouraged by the prospect of better prices for pig iron.

The St. Louis Stamping Company are erecting a new five-story brick building, corner of Cass avenue and Second street, as a workhouse to meet the demands for their manufactures.

Evens & Howard, of the Cheltenham Fire Brick, Gas Retort and Sewer Pipe Works, St. Louis, report that they are running their works day and night, and still they are behind their orders.

The Laclede Fire Brick Manufacturing Company, St. Louis, is shipping a bosh to the Rockwood Furnace of the Roane Iron Company, Chattanooga.

INDIANA.

The Atlas Works, at Indianapolis, are employing 175 operatives and are very busy. They are now erecting a fine 200 horse-power engine for a large flouring mill in New Orleans. Their St. Louis house is also busy.

The mill and furnace of the Wabash Iron Company, at Terre Haute, are running full. The mill is running single turn.

Messrs. A. G. Austin & Co., wholesale hardware dealers, at Terre Haute, have been, and are still doing a very heavy business; their trade in carriage and wagon woodwork has been large this season.

Chandler & Taylor, engineers, machinists and founders, are running their works full. They make a specialty of portable engines, of which they made a good display at the Indiana State fair, together with other fine machinery.

The Capital City Rolling Mill, at Indianapolis, is running full, single turn, employing 125 hands. Their trade has been quite large this season.

E. C. Atkins & Co. are running their saw factory at Indianapolis with a full set of hands. They are filling large orders for their diamond cross-cut saws. They made a handsome display of saws at the Indiana State fair.

ILLINOIS.

The North Western Horse Nail Company, of Chicago, are having a very large demand this fall for their horse nails. We are informed that they had a large stock on hand in June, but are now running their factory overtime to fill orders. Their present production is 6 tons per day, and they report their orders 30 tons ahead of them. This sterling nail is now in the New York market, and a full supply can be found with Graham & Haines, 113 Chambers street, who are the agents.

The manufacturing interests of East St. Louis are looking up. The Missouri Car Works and Foundry, the car department of which closed some four weeks ago, throwing some 300 men out of employment, has received a large contract for cars; the works will be put in motion within two weeks at the latest, and a force of 400 additional men will be employed. The company have been running in the foundry department right along, turning out 60 wheels and making between 6 and 7 tons of castings a day. The foundry employs 150 men, and the re-employment of 400 additional hands will liven things up wonderfully. The old East St. Louis rail mill, owned by John Allerby, of St. Louis, which has lain idle for a long while, and which was used during the strike as a barracks by the regular army, has been thoroughly repaired, a watchman put over it, and, although the managers are not able to speak definitely, still it can safely be said it will, before very long, glare and smoke as of old.

KENTUCKY.

T. K. Ball & Son have leased the Maysville Foundry and will take possession November 8th.

Dennis Long & Co. have closed a contract for $100,000 worth of water pipe for the new water-works at Little Rock, Ark. They are running night and day, and are still behind with previous orders.

The Licking Rolling Mill, Covington, is again in operation.

TENNESSEE.

An English co-operative company has purchased the old Oakdale Furnace, in Roane, together with 50,000 acres of land, a large portion surrounding the works, and others lying in the adjoining counties of Scott, Morgan and Cumberland, on which it is proposed to locate large colonies, both from England and the Northeastern States, to carry on mining, manufacturing and farming operations on a very extensive scale.

Curious Mechanism.—A monk of the Benedictine monastery, at Raigern, between Brunn and Vienna, has completed a mechanical curiosity in the shape of a self-moving terrestrial globe, 1.4 meters in diameter. A combination of wheels gives it a motion similar to that of the earth, and when once set going it will revolve for three weeks. At the north pole of the axis are dial plates, on which the days, months, etc., are indicated, and over these is a smaller globe, by means of which the motion of our planet round the sun is exhibited. The larger globe sets the smaller one in motion by the agency of 12 wheels. The construction of the mechanism took more than 10 years' patient application, and was only completed after numerous experiments. As regards geographical details, the map on the globe is carefully drawn, and shows all the latest discoveries. The steamer routes, railway, telegraph lines, hights of mountains and the depths of the ocean are all distinctly shown. By a somewhat odd conceit, the year in which the globe was begun (1866) can be ascertained by re-arrangement of certain letters of the Benedictine motto inscribed on it: "*In hoc, sicut in omnibus, glorificetur Deus.*" The maker of the globe is a self-taught mechanician and artist, who, during the past 30 years, has adorned the monastery with numerous examples of his skill and ingenuity.

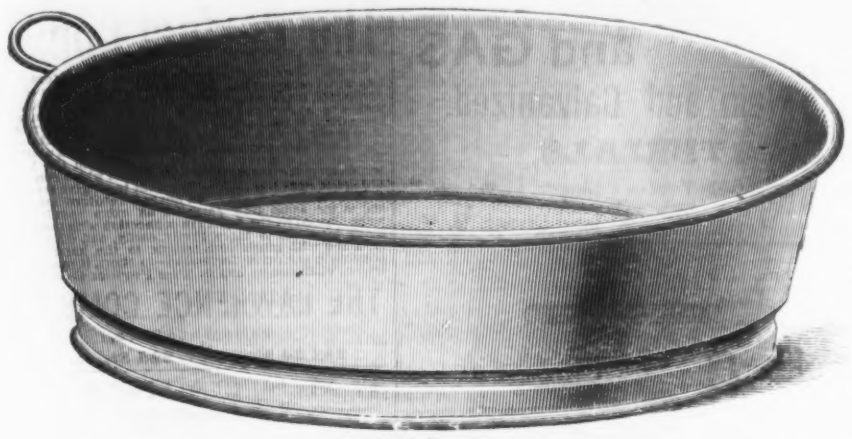
Corrugated Iron Huts for Russia.—Four large London firms have been invited to tender for the supply of corrugated iron for huts to contain 100,000 Russian soldiers. The huts are to be of four sizes, for 25, 50 100 and 500 men. They are to be delivered at Antwerp, and sent direct to Bucharest across the Continent by rail. These are for erection in the neighborhood of Bucharest. Orders have also been issued for eight railway stations for a strategic railway. These are to be complete in every way, and are to be provided with heating apparatus.

Apropos of the present attempt to move Cleopatra's needle, an exchange calls to mind the fact that this is not the first attempt. In 1801 the French forces in Egypt were defeated by the British, under General Abercromby, in a battle near Alexandria, during which that officer was mortally wounded. After the campaign, the Earl of Cavan, who was left in command of the British forces in Egypt, conceived the idea of transporting the fallen obelisk. Funds were contributed for this purpose by subscription from the officers and soldiers there. A captured frigate was purchased of the prize agents, and arrangements were made to ship the monument on board. The plan was to cut a stern port of sufficient size in the vessel, put a strong platform within the hold, and then introduce the obelisk end on, moving it by rollers. A stone pier was begun, alongside of which the vessel was to be brought. Considerable progress had been made in the work, when it was stopped by orders from Lord Keith and Gen. Fox, who held superior command. A plate was afterward prepared, reciting the particulars of the British victories in Egypt, and was inserted in a cavity made between the upper and the lower stones of the pedestal of the obelisk, the stones being subsequently replaced so as to conceal the cavity.

The Boston *Journal of Commerce* says: Importers and others who have obtained judgments against the United States for claims for the refunding of duties illegally collected, have for years been waiting for their pay. These claims have accumulated so that more than a million dollars would be required to settle them, and with the suits pending, some three millions in all. The gross injustice of not promptly paying such judgments is evident and a serious reflection upon the government. We are glad to see that a bill has been introduced by Mr. Willis, of New York, providing for the payment of such claims. The evil, it appears, has been allowed to grow, some of the cases dating back prior to 1861. A great nation should not thus trifle with justice, and in the great majority of cases the money to be paid represents what has been unjustly and illegally exacted—thus making the offense still worse.

Of the 8 furnaces in Connecticut and New York in which Senator Barnum is largely interested, two at East Canaan and one each at Sharon and Millerton are in blast, one at Lime Rock just gone out of blast and one at Huntsville just gone into blast. The production is about 3000 tons per annum to each furnace, and the product goes to the Middle and Western States.

KETCHAM'S
Seamless Metal-Rimmed
FLOUR SIEVES.
PATENTED.



12⅜ inch diameter.

This improved Flour Sieve is fast becoming known as the leading article of its kind in the market. It is constructed of a single sheet of metal, without seams or solder, and has no rough ends to injure the hands while sifting. Neatly packed, one dozen in a box. Made from 14, 16, 18, 20, 24 or 30 mesh cloth, both iron and plated, and sold at low rates. Special cards on application.

Manufactured and sold by

E. KETCHAM & CO.,
MAKERS OF ALL KINDS OF

PLANISHED, "DEEP" and "COMMON" STAMPED, Japanned, Pieced and Miscellaneous TIN WARES,

TINNERS' TRIMMINGS, HOUSE FURNISHING HARDWARE,

Britannia Tea and Coffee Pots, Fry Pans, Coal Hods, Patent Fluted Funnels, Seamless Dripping Pans

And other Specialties. Dealers in

Tinners' Tools and Machines, Plymouth Rivets, Patent Stove Pipe and Elbows, &c., &c.

100 Beekman, 289 Pearl and 58 Cliff Streets, NEW YORK.

LESTER SAW.

This Machine is the result of combining all the qualities which the best practical experience thus far has been able to name as the requisites of a perfect Amateur Tool. While it is as cheap as the cheapest, it certainly is as good as the best. It consists of a Scroll Saw with tilting table for inlaid work, and patent clamps into which a saw can be inserted in the dark. A Turning Lathe, with a complete set of best steel turning tools, Emery Wheel with wide and narrow rim, Boring Attachment with six stubs, Steel Drills which will drill wood or iron, and a Circular Saw for cutting straight edges. Every part is well built and will do good work. A box is attached to each machine for holding the small tools. When shipped it is taken down and packed in a small compass. It is only the work of a few moments to put it up again in working order. Price, complete, $8.00. Without the Lathes, $6.00.

DESCRIPTION OF THE SEVERAL PARTS.

THE SCROLL SAW.

Length of arms	20½ in.
Length of sweep for work	17 "
Height of table above floor	31 "
Diameter of table	6 "
Length of stroke	1½ "
Diameter of driving wheel	12 "
Diameter of balance wheel	6⅝ "
Diameter of emery wheel	3½ "
Number of strokes of saw per minute	1,000
Number of revolutions of emery wheel per minute	1,000

These speeds are made with a tread of 150 per minute.

Weight of Scroll Saw, 30 lbs.

THE LATHE.

Weight	6¼ lbs.
Length of ways over all	15¾ in.
Distance between centers	9 "
Swing	3 "
Length of slide rest	4½ "
Height of head and tail stocks above ways	2⅝ "
Diameter of cone pulley	1⅛ "
Number of revolutions per minute	7,000

THE CIRCULAR SAW.

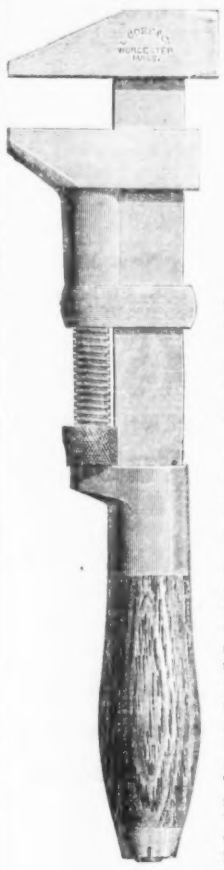
Diameter of saw	½ in
Length of saw arbor	2¾ "
Height from floor to table	33 "
Size of table	4x5½ "
Number of revolutions per minute	7,000
Weight	½ lb.

Total Weight of Combination, 36 3-4 lbs.

MILLERS FALLS CO.,
No. 74 Chambers Street,

NEW YORK.

L. COES'
Genuine Improved Patent
SCREW WRENCHES.



Manufactured by

L. COES & CO.,
Worcester, Mass.

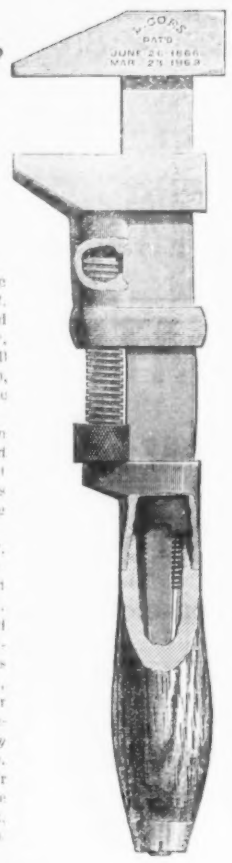
Established in 1839.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush against square, solid bearings that cannot be forced out of place by use, verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."



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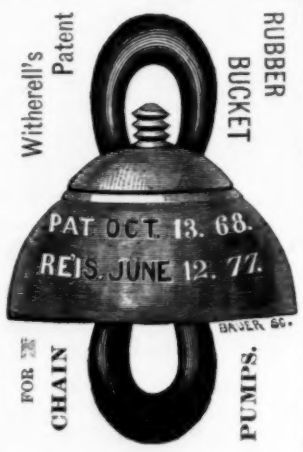

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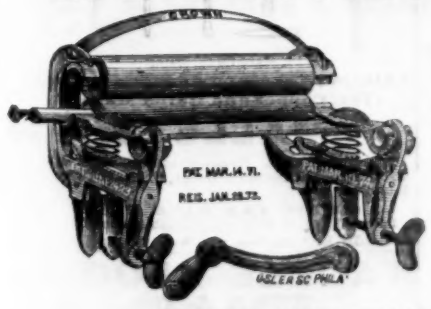

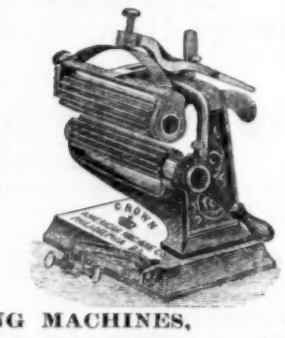

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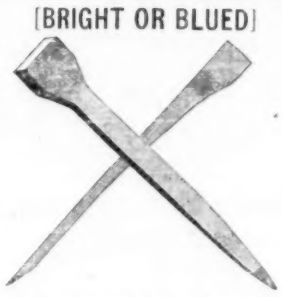

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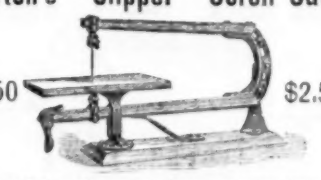
$2.50  $2.50

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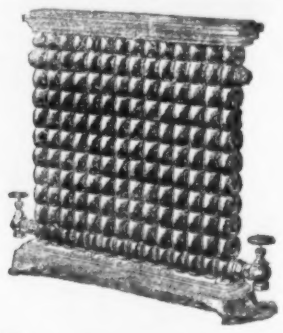

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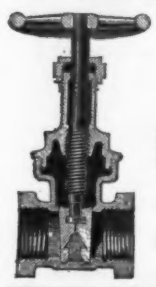

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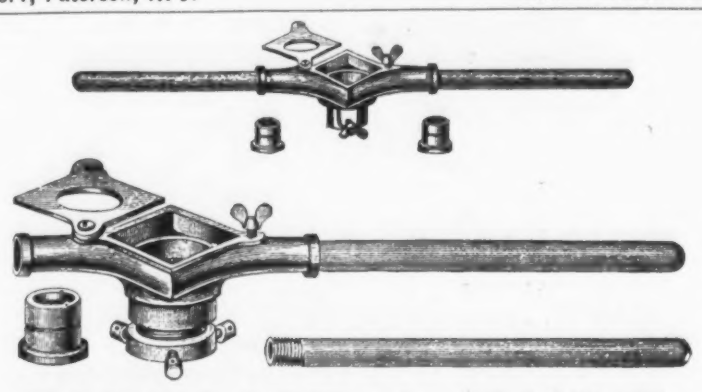

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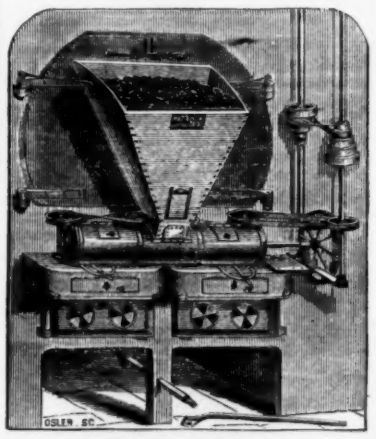

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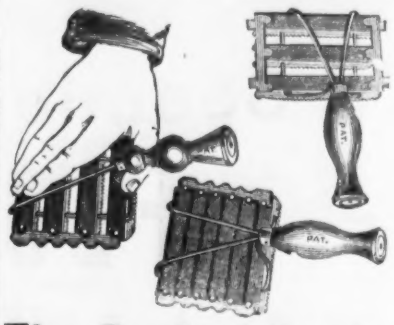

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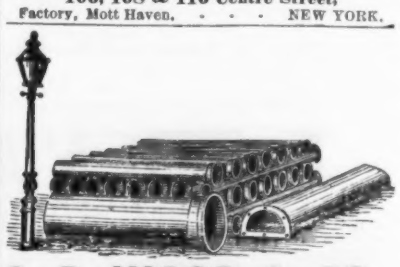

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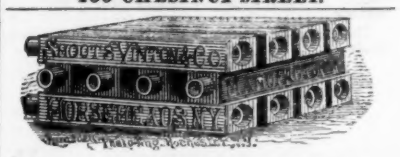

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Strobel & Weisbrodt, Cincinnati, O. ... 25

Faucets, Brass, *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y. ... 26

Faucets, *Self-Measuring. Makers of.*
Enterprise Mfg. Co., of Pa., Phila. and N. Y. ... 36

Feed Cutters.
Silver & Deming Mfg. Co., Salem, O. ... 8

Files, *Importers of.*
Carr J. & Riley 82 John, N. Y. ... 34
Fisher Joseph S., 411 Commerce, Phila. ... 17
Frasse Peter A. & Co. 95 Fulton, N. Y. ... 8
Moss F. W., 80 John, N. Y. ... 34
Sanderson Bros. & Co., 16 Cliff, N. Y. ... 24

Files, *Manufacturers of.*
American File Co., Pawtucket, R. I. ... 8
Auburn File Works, 89 Chambers, N. Y. ... 8
Barnett G. & H. 41 and 43 Richmond, Phila. ... 8
Disston Henry & Sons, Phila. ... 29
Draper C. T. & Co., Sing Sing, N. Y. ... 8
Everhart James M., Scranton, Pa. ... 42
Heller & Bros., Newark, N. J. ... 8
Johnson & Bro., 1 Commercial, Newark, N. J. ... 8
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila. ... 8
Nicholson File Co., Providence, R. I. ... 28
Paul Chas. B., Williamsburgh, N. Y. ... 8

Fire Brick. *Makers of.*
Brooklyn Clay Retort and Fire Brick Works, Van Dyke, St., Brooklyn N. Y. ... 33
Evens & Howard, St. Louis, Mo. ... 33
Gardner, Stuart & Co., Pittsburgh. ... 33
Hall A. & Sons, Perth Amboy, N. J. ... 33
Hall & Sons, Buffalo, N. Y. ... 33
Maurer Henry, 418 East 23d, N. Y. ... 33
Kreischer B. & Son, 58 Goerck, N. Y. ... 33
Newton & Co., Albany, N. Y. ... 33
Ostrander James & Son, Troy, N. Y. ... 33
Valentine M. D. & Bro., Woodbridge, N. J. ... 33
Watson John R. Perth Amboy, N. J. ... 33
Weber Adam, 633 E. 15th, N. Y. ... 33

Fire Escapes.
Falk L., 165th, N. Y. ... 42

Flint and Emery Paper and Cloth.
Baeder, Adamson & Co., 730 Market, Phila. ... 8

Flour Sieves.
Ketcham E. & Co., 100 Beekman, N. Y. ... 25

Flower Pot Stands.
Barnum E. T., Detroit, Mich. ... 2

Fluting Machines.
The American Machine Co., Philadelphia ... 25
Weeks A. A., 82 John, N. Y. ... 32

Forges, Portable, etc.
Keystone Portable Forge Co., Philadelphia. ... 38

Founders and Machinists.
Saml. J. Cresswell Jr., 812 Race, Phila., Pa ... 6

Foundry Facings.
Paxson J. W. & Co., 514 Beach, Phila. ... 5
Whitehead Bros., 517 W. 15th, N. Y. ... 4

Friction Mats.
Colt J. B. & Co., 297 Broadway, N. Y. ... 17

Furnaces. *Makers of*
Richmond & Potts, 119 S. Fourth, Phila., Pa. ... 5

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y. ... 4

Governors.
Junius Judson & Son, Rochester, N. Y. ... 40

Grain Cradles.
Semple & Birge Mfg. Co., St. Louis, Mo. ... 18

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y. ... 35
Worthington & Sons, North Amherst, O. ... 35

Guns, &c.
Windmuller Louis & Roelker, 20 Reade N. Y. ... 20

Gunpowder. *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y. ... 34
Laflin & Rand Powder Co. 26 Murray, N. Y. ... 34

Hardware Commission Merchants.
Biglin Philip S., 110 Chambers, N. Y. ... 6
Graham & Haines, 113 Chambers, N. Y. ... 36
Heaton & Denckla, Philadelphia, Pa. ... 39
Walbridge G. B. & Co., 83 Reade, N. Y. ... 31

Hardware Dealers.
Brower John I. & Son, 288 Greenwich, N. Y. ... 9
Lloyd, Supplee & Walton, 625 Market, Phila. ... 36
Prouty Hardware & Mfg. Co., 59 Beekman, N. Y. ... 28
Quackenbush, Townsend & Co., 59 Reade, N. Y. ... 36
Shepard Sidney & Co., Buffalo N. Y. ... 31
Wilson J. Clark & Co., 81 Beekman, N. Y. ... 28

Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y. ... 35
King, Briggs & Co., 596 Broadway, N. Y. ... 17
Van Wart, Son & Co., 134 and 136 Duane, N. Y. ... 17
Harrold F. W., 78 Chambers, N. Y. ... 17
Windmuller Louis & Roelker 20 Reade N. Y. ... 20

Hardware Manufacturers.
American Spiral Spring Butt Co., 82 Beekman, N. Y. ... 42
Clark & Co. Buffalo, N. Y. ... 36
Cowles Hardware Co., Unionville, Ct. ... 8
Enterprise Mfg. Co., Phila. ... 36
Millers Falls Mfg. Co., 74 Chambers, N. Y. ... 25
Parr Geo., Buffalo, N. Y. ... 28
Peck G. Webster, 110 Chambers, N. Y. ... 8
Perin & Gaff Mfg. Co., Cincinnati, O. ... 33
Pratt & Co., Buffalo, N. Y. ... 31
Providence Tool Co., Providence, R. I. ... 13
Russell & Erwin Mfg. Co., New York. ... 10 & 11
Stanley Works, New Britain, Conn. ... 32
Union Mfg. Co. 99 Chambers, N. Y. ... 7
Van Wagoner & Williams 82 Beekman, N. Y. ... 42
Wilson Mfg. Co., New London, Conn. ... 6

Hardware Specialties.
Grant & Co., Newark, N. J. ... 36
Jessup & Sterling, 7 and 9 Cliff, N. Y. ... 4
Perin & Gaff Mfg. Co., Cincinnati, O. ... 33
Semple & Birge Mfg. Co., St. Louis, Mo. ... 6
Shepard Sidney & Co., Buffalo, N. Y. ... 31
Spencer & Underhill, 94 Chambers, N. Y. ... 31

Hay Knives.
Holt Hiram & Co., East Wilton, Me ... 36

Hinges.
Lewis, Oliver & Phillips, Pittsburgh, Pa. ... 18

Hog Ringers
Chambers, Bering & Quinlan, Decatur, Ill. ... 35

Hoisting Engines. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. ... 9
Mundy J. S., Newark, N. J. ... 40

Horse Clippers.
Shannon J. Jacob, Philadelphia, Pa. ... 41

Horse Nails. *Makers of*
Ausable Horse Nail Co. 35 Chambers, N. Y. ... 8
Globe Nail Co., Boston, Mass. ... 6
National Horse Nail Co., Vergennes, Vt ... 25
Northwestern Horse Nail Co., Chicago, Ill. ... 6
Pratt & Co., Buffalo, N. Y. ... 31
Putnam S. S. & Co., Neponset, Mass. ... 8

Horse Shoes. *Makers of.*
Boston Rolling Mills, 17 Batterymarch, Boston. ... 4
Burden Iron Works, Troy, N. Y. ... 4
Rhode Island Horse Shoe Co., Providence, R. I. ... 6
Schoenberger & Co., Pittsburgh, Pa. ... 4

Hydrants, &c.
McLean John, 300 Monroe, N. Y. ... 38

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. ... 41
Lyon E. & Co., 470 Grand, N. Y. ... 41

Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co. ... 41

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. ... 4
Crane U. O., 104 John, N. Y. ... 4
Hatry A. G., Pittsburgh, Pa. ... 4
Hazard T. D. 204 Pearl N. Y. ... 4

Iron, Charcoal, *Warm or Cold Blast.*
Quincy John W., 98 William, N. Y. ... 4

Iron Commission Merchants.
Adams Hugh W., 56 Pine, N. Y. ...
Lowe S. B., Chattanooga, Tenn. ... 6
Spooner & Collins, St. Louis, Mo. ... 6
Thompson John H. & Co., 32 Pine, N. Y. ... 4

Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y. ... 4

Iron Dealers.
Abeel Brothers, 190 South, N. Y. ... 4
Bonnell, Botsford & Co., Youngstown, O. ... 4
Borden & Lovell, 70 and 71 West, N. Y. ... 4
Cooney Daniel F., 88 Washington, N. Y. ... 4
Huerstel G., 90 Market Slip, N. Y. ... 4
Fuller, Lord & Co., 139 Greenwich, N. Y. ... 4
Harrison & Gilloon, 558 to 562 Water, N. Y. ... 4
Jackson & Chase, 206 and 208 Franklin, N. Y. ... 4
Judson B. F., 457 and 459 Water, N. Y. ... 4
Ogden Wallace, 85, 87, 89 and 91 Elm, N. Y. ... 4
Pierson & Co., 24 Broadway, N. Y. ... 4
Quincy John W., 98 William, N. Y. ... 4
Randall & Jones (Taylor Iron), 10 Oliver, Boston, Mass ... 6
Reed John H. & Co. ... 6
Richards D. W. & Co., 92 Mangin St., N. Y. ... 4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y. ... 4
Warner A. B. & Sons, 28 and 29 West, N. Y. ... 4
Williamson James & Co., 69 Wall, N. Y. ... 4
Whitney A. R. & Bro. 58 Hudson N. Y. ... 4

Iron, *(Manufacturers' Agents.)*
Levis & Kimball, Philadelphia, Pa ... 5

Iron. *Manufacturers of.*
Boston Rolling Mills, 17 Batterymarch, Boston ... 6
Bradley, Reis & Co., 24 Cliff, N. Y. ... 6
Burden Iron Works, Troy, N. Y. ... 4
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Everson, Macrum & Co., Pittsburgh, Pa. ... 6
Kirkpatrick, Beale & Co., Pittsburgh, Pa. ... 6
Leonard John, 450 & 451 West st. N. Y. ... 4
Oxford Iron Co., 81 Washington, N. Y. ... 4
Phœnix Iron Co., 410 Walnut, Phila. ... 5
Rowland James & Co., 930 N. Delaware, Phila. ... 5
Rowland Wm. & Harvey, Phila. ... 42
Shoenberger & Co., Pittsburgh, Pa. ... 4
Susquehanna Iron Co., Columbia, Lancaster Co. Pa. ... 4
The Passaic Rolling Mill Co., Paterson, N. J. ... 4
U. S. Iron and Tin Plate Co., Pittsburgh, Pa. ... 4
Zug & Co., Pittsburgh, Pa. ... 4

Iron, Planished Sheet *Manufacturers of*
Wood W. D. & Co., Pittsburgh, Pa. ... 4

Iron Pipe (Tin Lined.)
Tatham & Bros., 82 Beekman, N. Y. ... 8

Iron Railings, etc.
Nellis A. J. & Co., Pittsburgh ... 18

Iron, Swedish. *Importers of.*
Mitander Nils, 69 William, N. Y. ... 4

Ironware (Granite.)
St. Louis Stamping Co., St. Louis, Mo. ... 33

Japanese Paper Ware.
Jennings Bros., 352 Pearl, N. Y. ... 7

Japans (Copal.)
Moller & Schumann, Marcy & Flushing Avenues, Brooklyn, N. Y. ... 37

Knob Screws.
Thurston Knob Screw Co., Marlboro', N. H. ... 12

Lanterns, *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. ... 42
Howard & Morse 45 Fulton, N. Y. ... 2

Lathe Dogs.
North Selden G., Philadelphia ... 41

Lathes.
Johnson, Jr. Israel H. & Co., Philadelphia. ... 41
Shepard H. L. & Co., Cincinnati, O. ... 38

Lead Pipe, &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa. ... 2

Levels.
Disston Henry & Sons, Phila. ... 29

Locks. *Manufacturers of*
Bohannan Wilson, Broadway and Kossuth, Brooklyn E. D. ... 28
Romer & Co., Newark, N. J. ... 28
Union Nut Co., 78 Beekman, N. Y. ... 36
Yale Lock Mfg. Co., 298 Broadway, N. Y. ... 7

Machinery. *Makers of.*
Bliss & Williams, 167 Plymouth, Brooklyn ... 41
Passe Ernest, Cincinnati, O. ... 12
Pittsburgh Mfg. Co., Pittsburgh, Pa. ... 41
Pratt & Whitney Co., Hartford, Conn. ... 38
Sellers Wm. & Co., 1600 Hamilton Phila ... 41
The Bullard Machine Co., 14 Dey, N. Y. ... 20
Wetherill Robert & Co. Chester, Pa. ... 38

Machine Screws. *Makers of.*
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. ... 12

Machinists' Tools. *Makers of.*
Blaisdell P. & Co., Worcester Mass. ... 40
David A. J. & Co. Newark, N. J. ... 41
Prentiss H. & Co., 14 Dey, N. Y. ... 12

Machinists.
Leng & Ogden, 212 Pearl, N. Y. ... 32

Malleable Iron Castings. *Maker of.*
Hammer & Co., Branford, Ct. ... 40

Measuring Tapes.
Eddy GeoM. & Co., 353 Classon Ave., Brooklyn, N. Y 6

Mallets.
N. Y. Handle & Mallet Works, 456 E. Houston ... 26

Manganese.
Pyrolusite Manganese Co., 214 Pearl, N. Y. ... 34

Meat Choppers.
Goodell & Co., Antrim, N. H. ... 9
Kinyon Bros., Raritan, N. J. ... 7

Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa ... 34

Metal Dealers and Brokers.
Crane U. O., 104 John, N. Y. ... 4
Dickerson, Van Dusen & Co. 29 & 31 Cliff, N. Y. ... 2
Gregg H. L. Co. 108 Walnut, Phila. ... 5
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila. ... 5
Quincy J. W., 98 William, N. Y. ... 27
Sellew R. & Co., St. Louis Mo. ... 2

Metal Elbows.
Hogen Elbow Co., Cleveland, O. ... 32

Metallurgists.
Britton J. Blodgett 339 Walnut Phila. ... 6

Metals Perforated.
Hayes G., 71 8th ave. ... 2

Metal Roofing.
Brass Goods Mfg. Co., 280 Pearl N. Y. ... 2

Mica.
The Chester Mica and Porcelain Co., 87 Liberty, N. Y. 3

Miners' Candles. *Makers of*
James Boyd's Sons, 10 and 12 Franklin, N. Y. ... 40

Models.
Lennox & Paine, Cleveland, O. ... 36

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. ... 42

Mowing Machine Knife Grinder.
Fisher Henry, Canton, O. ... 34

Nails
Aurora Iron & Nail Co., Aurora, Ind. ... 5
Schoenberger & Co., Pittsburgh, Pa. ... 4
Zug & Co., Pittsburgh, Pa. ... 4

Nail Machinery.
Coyne & Hatry, Pittsburgh, Pa ... 4

Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y. ... 6

Nickel Platers.
Hartman John, 37½ N. Seventh, Philadelphia ... 27
Jackson Geo. W., 21 E. 13, N. Y. ... 27
Manhattan Nickel Works, 180 and 182 Center, N. Y. ... 27

Nickel Platers' Supplies.
Colt A. T., 47 Beekman, N. Y. ... 27
Zucker & Levett, 639 & 641 W. 51st, N. Y. ... 27

Norway Shapes. *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila. ... 42

Note Broker.
Gallaudet P. W. 3 and 5 Wall, N. Y. ... 4

Nuts, Bolts, etc., *Makers of.*
Clark Bros. & Co., Milldale, Conn. ... 12
Fuller Bros. & Co., 139 Greenwich, N. Y. ... 4
Haskell W. H. & Co., Pawtucket, R. I. ... 13
Lewis, Oliver & Phillips, Pittsburgh, Pa. ... 13
Russell, Birdsall & Ward, Port Chester, N. Y. ... 47
Shelton Co., Birmingham, Conn. ... 42
Sternbergh J. H., Reading, Pa. ... 42
Union Nut Co., 78 Beekman N. Y. ... 36

Oil Cook Stoves.
C. Keissner & Co., 242 Pearl, N. Y. ... 18

Oil Lubricating, *Makers of*
Lester Oil Co., 81 Maiden Lane, N. Y. ... 40

Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia. ... 5

Packing (Steam).
Symonds & Co., Philadelphia ... 38

Paint (Iron).
Pittsburgh Iron Paint Co., Pittsburgh, Pa. ... 35

Paints and Oils. *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y. ...

Pans, (Dripping and Bread.)
Lewis, Dalzell & Co., Pittsburgh, Pa ... 3

Patent Solicitors.
Howson & Son, Phila. and Washington, D. C. ... 18
Spencer A. H. 28 State, Boston, Mass. ...
Stetson Thomas D. 23 Murray N. Y. ... 18

Pens (Steel).
Perry & Co., Limited, 112 & 114 William, N. Y. ... 27

Picks, *Makers of*
Pierson & Co., 24 Broadway, N. Y. ... 2

Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y. ... 26
McNab & Harlin Mfg. Co., 56 John, N. Y. ... 26
Pancoast & Maule, 227 Pear, Phila. ... 26

Pipe, Water and Gas, *Makers of.*
McNeal & Archer, Burlington, N. J. ... 6
Wood R. D. & Co., 400 Chesnut, Phila. ... 26

Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass. ... 13
D. R. Barton Tool Co., Rochester, N. Y. ... 13

Planes. *Manufacturers of*
D. R. Barton Tool Co., Rochester, N. Y. ... 13
Stanley Rule & Level Co., 35 Chambers, N. Y. ... 4

Plated Ware.
Derby Silver Co., Derby, Ct. ... 42
Hall, Elton & Co., 75 Chambers, N. Y. ... 17

Pliers.
Hagstoz & Thorpe, Ledger Building, Phila. ... 17

Plows.
Meikle Thomas & Co., Louisville, Ky. ... 12

Plows, Chilled Iron. *Makers of.*
South Bend Iron Works, South Bend, Ind. ... 39

Plumbago.
Congreve & Sanders, 104 John, N. Y. ... 3

Plumbers' Materials, *Manufacturers of*
Everhart Jas. M., Scranton, Pa. ... 42
Carr Wm. S. & Co. 106 Centre, N. Y. ... 26

Presses, Power, *Makers of.*
Bliss & Williams, 167 Plymouth, Brooklyn ... 41
Merriman A. H., West Meriden, Ct. ... 38
The Stiles & Parker Press Co., Middletown, Ct. ... 33

Pressure Blowers. *Makers of.*
Keystone Portable Forge Co., Philadelphia. ... 38

Pulleys, Friction.
Mason Volney W. & Co., Providence, R. I. ... 42
Penfield Block Works, Lockport N. Y. ... 18
Thompson Joseph, 36 Burling Slip ... 8

Pumping Engines, (Hot Air) *Makers of*
Rider, Wooster & Co., Walden, Orange Co., N. Y. ... 39

Pumps, *Makers of.*
Douglas W. & B., Middletown Conn. ... 7
Kilvert & Tappen Boston, Mass. ... 41
Nason Mfg. Co., 71 Fulton, N. Y. ... 7
Rider, Wooster & Co., Walden, Orange Co., N. Y. ... 39
Rumsey & Co., Seneca Falls, N. Y. ... 7
Rumsey S. M. & Co., St. Louis, Mo. ... 25
Union Mfg. Co., 98 Chambers, N. Y. ... 7

Railroad Supplies.
Jackson & Tyler Baltimore, Md. ... 35
Nicolls Wm. J., Baltimore, Md. ... 37

Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa. ... 6
Cambria Iron Co., Johnstown, Pa. ... 5
Cleveland Rolling Mill Co., Cleveland, O. ... 6
The Edgar Thomson Steel Co., 57 Broadway, N. Y. ... 35
Wood & Leman, 31 Wall, N. Y. ... 4

Razor Straps, *Makers of.*
B. F. Badger & Son Charlestown, Mass. ... 8

Rivets.
Gilmor Wm. of Wm., Baltimore, Md. ... 12
Townsend W. P. & Co., Pittsburgh, Pa. ... 12

Road Rollers.
Pioneer Iron Works, 143 William, Brooklyn, N. Y. ... 39

Road Scrapers, &c.
Semple & Birge Mfg. Co., St. Louis, Mo. ... 6

Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor 16th and Buttonwood, Phila. ... 41

Rotary Shears.
Newbold R. S. & Son, Norristown, Pa. ... 40

Rules, *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St. ... 3
Stephens & Co., Riverton, Conn. ... 33

Saddlers' Tools.
Osborne C. S. & Co., Newark, N. J. ... 23

Sand and Emery Paper, *Makers of*
Baeder, Adamson & Co., 730 Market, Phila. ... 8

Sad Irons.
Enterprise Mfg. Co., Philadelphia ... 36

Sash Fasteners.
Babcock C. P., Portland, Me. ... 13

Saws. *Makers of.*
American Saw Co., Trenton, N. J. ... 35
Boynton E. M., 80 Beekman, N. Y. ... 35
Disston Henry & Sons, Phila. ... 29
Peace & Hogan, Williamsburg, N. Y. ... 35
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. ... 35

Saw Frames, Wood. *Makers of.*
Peace Harvey W. Williamsburg, N. Y. ... 35

Scales. *Manufacturers of.*
Brandon Mfg. Co., Brandon, Vt. ... 7
Chattillon John & Sons, 91 Cliff, N. Y. ... 9
Riehle Bros., 9th above Master, Phila. ... 33
Southwark Hardware Co., Philadelphia ... 27

Screws. *Makers of.*
American Screw Co., Providence, R. I. ... 16
Miles F. S., 206 Quarry, Phila. ... 12
Russell & Erwin Mfg. Co., New York ... 10 & 11

Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y. ... 6

Screw Drivers, *(Improved) Makers of.*
Disston Henry & Sons, Phila. ... 29

Scroll Saws.
Excelsior Scroll Saw Co., New Bedford, Mass. ... 36
Foot James D. 22 Platt N. Y. ... 25
Trump Bros., Wilmington, Del. ... 3

Scythe Stones.
Dishman F. E., New Albany, Ind. ... 35
Pike A. F., East Haverhill, N. H. ... 18

Shafting.
Wood Thomas, Philadelphia ... 39

Shovels, &c.
Hubbard, Bakewell & Co., Pittsburgh, Pa ... 18
Hussey, Binns & Co., Pittsburgh, Pa. ... 39
Remington E. & Sons, 57 Reade, N. Y. ... 39

Shot, etc.
Sparks Thos. W., 121 Walnut, Philadelphia. ... 7

Shears Scissors &c.
Marx Bros., 489 B'way, N. Y. ... 17

Shears (Sheep).
Hildick A. H. & Co., 12 Warren, N. Y. ... 17

Sieves (Metallic).
Dayton Geo. E., Chicago ... 38

Skates.
Peck & Snyder, 124 Nassau, N. Y. ... 28

Skate Sharpeners.
Kistner & Hummel, Selin's Grove, Pa. ... 37

Sleighs.
Crosby, Gilzinger & Co., Rondout, N. Y. ... 42

Smelting Works.
Mackenzie & Sayre Mfg. Co., 141 Broadway, N. Y. ... 42
Reeves Paul S., 760 South Broad St. Phila. ... 42

Spelter.
Manning & Squier, 113 Liberty N. Y. ... 2

Springs.
Rowland Wm. & Harvey, Frankford, Phila. ... 42

Stamped and Japanned Tin Ware.
Shepard Sidney & Co., Buffalo, N. Y. ... 31
The Chicago Stamping Co., Chicago, Ill. ... 3

Stave Jointer.
Crossley H. A., Cleveland, O. ... 25

Stave Sawing Machine.
Gerlach Peter & Co., Cleveland, O. ... 41

Steam Hammers, etc., *Makers of.*
Bradley Mfg. Co., Syracuse, N. Y. ... 38
Dudgeon Richard, 24 Columbia, N. Y. ... 41

Steam Pumps etc., *Manufacturers of*
Cameron A. S., East 23d, N. Y. ... 40
Clayton Jas., 11 Water, Brooklyn, N. Y. ... 8
Crane Bros. Mfg. Co. Chicago, Ill. ... 36
McGowan John H. & Co., Cincinnati, O. ... 40
Valley Machine Co., East Hampton, Mass. ... 40

Steam Traps
Albany Steam Trap Co., Albany, N. Y. ... 40

Steel Castings. *Manufacturers of*
Chester Castings Co., Evelina, Phila. Pa. ... 42
Eureka Cast Steel Co., Chester, Pa. ... 18
Flagg Stanley G. & Co., 216 & 218 N. 3rd, Phila. ... 42
Pittsburgh Steel Casting Co., Pittsburgh, Pa. ... 42

Steel Importers.
Carr J. & Riley, 82 John, N. Y. ... 34
Sulzbacher, Hyman, Wolff & Co., 46 Cliff, N. Y. ... 34
Hobson Francis & Son, 97 John, N. Y. ... 34
Jonas, Meyer & Colver, Hartford, Conn. ... 34
Moss F. W., 80 John, N. Y. ... 34
Piersons & Co. 24 Broadway, N. Y. ... 4
Van Wart, Son & Co., 134 and 136 Duane, N. Y. ... 17

Steel (Mushet Special).
Randall & Jones, 10 Oliver, Boston, Mass ... 34

Steel Manufacturers.
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Crome Steel Co. Brooklyn, E. D. N. Y. ... 35
Midvale Steel Works, Nicetown, Phila., Pa. ... 34
Miller Metcalf & Parkin, Pittsburgh. ... 34
Rowland Wm. & Harvey, Frankford Phila. ... 42
Smith, Sutton & Co., Pittsburgh, Pa. ... 24
Singer, Nimick & Co., Pittsburgh. ... 3
Sweet's Mfg. Co., Syracuse, N. Y. ... 34
The Edgar Thomson Steel Co., 57 Broadway, N. Y. ... 35
Wardlow S. & C., Sheffield, England. ... 34

Steel Name Stamps.
New York Stencil Works, 87 Nassau, N. Y. ... 37

Steel Shutters.
Clark & Co.'s 162 & 164 W. 27th, N. Y. ... 9

Steel Spiral Springs. *Manufacturers of*
Chatillon & Sons, 91 and 93 Cliff, N. Y. ... 9

Stencils.
Bryant O. G., Chicago, Ill. ... 37

Stocks and Dies.
Holroyd & Co., Waterford, N. Y. ... 12

Stokers.
Smith Dillwyn, 18 S. 6th, Philadelphia ... 26

Stone Ironware.
Metal Mfg. Co., St. Louis, Mo. ... 3

Stove Boards. *Manufacturers of*
Ansonia Brass and Copper Co., 19 and 21 Cliff, N. Y. ... 9
Haberman F., 294 Pearl, N. Y. ... 28
Shepard Sidney & Co., Buffalo N. Y. ... 31

Tacks.
American Tack Co., Fairhaven, Mass. ... 12
Brigham, Litchfield & Vining, S. Abington, Mass. ... 32
Dunbar, Hobart & Whidden, 116 Chambers, N. Y. ... 18
Field A. & Sons, Taunton, Mass. ... 9
Grundy Geo. C., 165 Greenwich, N. Y. ... 36
Shelton Co., Birmingham, Ct. ... 42

Taps and Dies.
Manning H. S. & Co., 111 Liberty, N. Y. ... 40
H. Prentiss & Co., 14 Dey, N. Y. ... 12

Tin Plate.
N. & G. Taylor Co., Philadelphia ... 33

Tin Plate. *Manufacturers of*
U. S. Iron and Tin Plate Co., Pittsburgh, Pa. ... 4

Try Squares, Bevels &c. *Makers of*
Bailey Leonard & Co., Hartford, Ct. ... 36
Disston Henry & Sons, Phila. ... 29

Tube Brushes.
Haurey Henry F., Newark, N. J. ...

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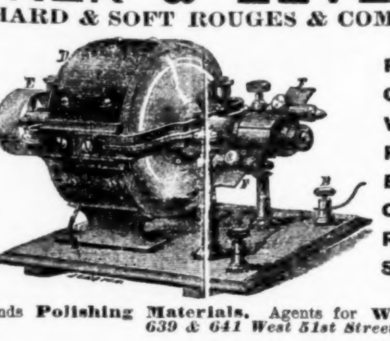

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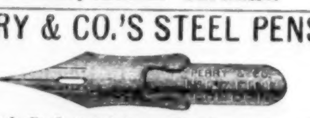

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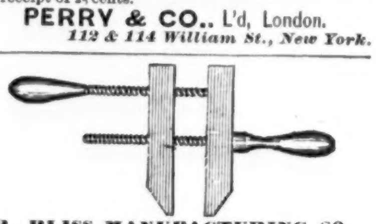

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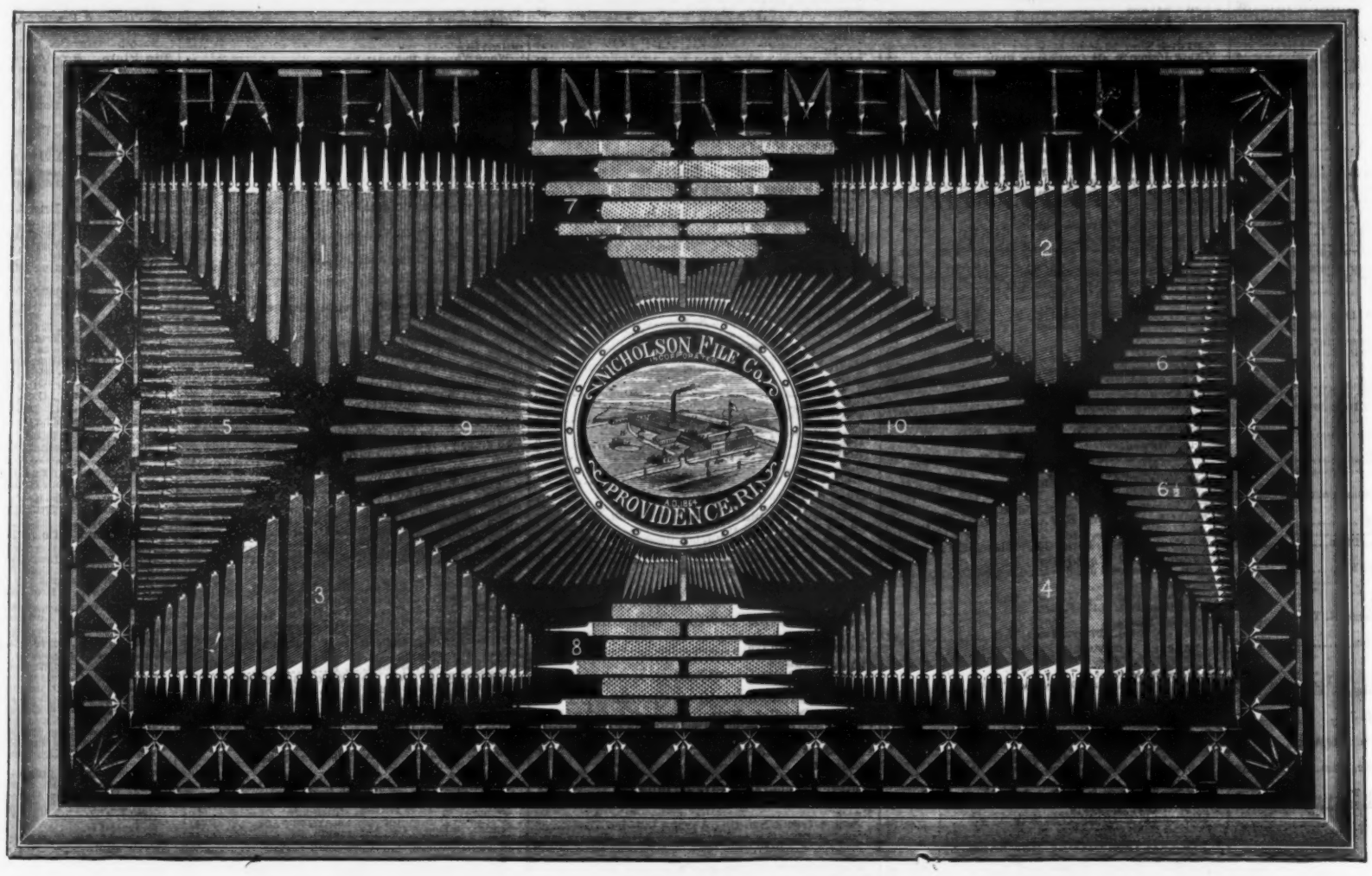

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1.–Half Round. 2.–Hand. 3.–Mill. 4.–Flat. 5.–Triangular. 6.–Pillar. 6½.–Knife. 7.–Plain Rasps. 8.–Tanged Rasps. 9.–Round. 10.–Square. 11.–Borders.

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Patent Stave Jointer.

The most Simple, Durable and Perfect Jointer made. In four sizes, jointing from 16 to 46 inches in length. In use from Maine to California. Is used by the largest stave and barrel manufacturers in the world. Will pay for itself in 90 days in saving of time and timber over any Saw Jointer ever used. Send for circular to.

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PASSENGER CAR LOCKS,
Bronzed, Nickel-Plated and Japanned.
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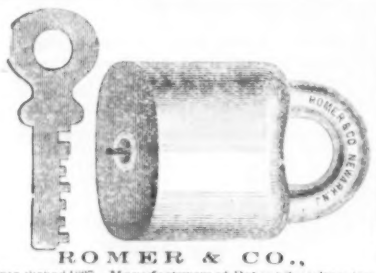

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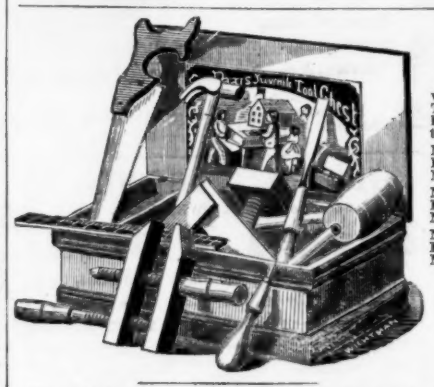

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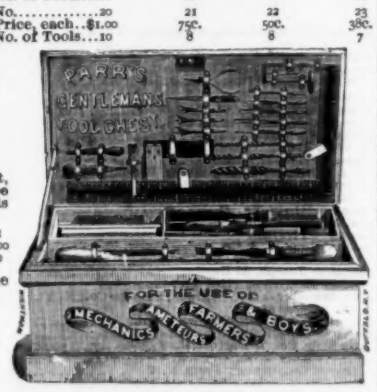
These chests are made of chestnut, with real black walnut trimmings, and Tools of superior quality. They range in price from $7.00 to 38c. each, as follows, according to size and number of Tools contained.

No.	12	13	14	15
Price, each	$7.00	$5.00	$3.75	$3.00
No. of Tools	36	28	24	20
No.	16	17	18	19
Price, each	$2.33	$1.92	$1.50	$1.25
No. of Tools	21	18	16	12
No.	20	21	22	23
Price, each	$1.00	75c.	50c.	38c.
No. of Tools	10	8	8	7



These Chests are made of heavy American Black walnut, with tools of extra superior quality. They range in price from $24.00 to $5.00, according to size and number of tools contained, as follows:

No.	6	7	8	9	10	11
Price, each	$24.00	$16.50	$12.50	$9.00	$7.00	$5.00
No. of Tools	80	55	45	33	25	20

Send in your orders early. A liberal discount to the trade. For price lists and discounts address

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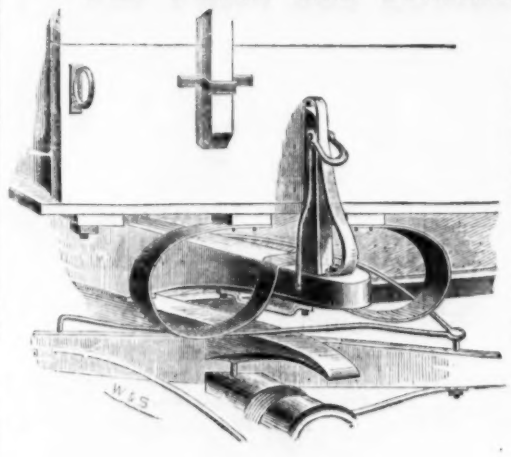
BOLSTER SPRINGS

For Farm and Lumber Wagons.



Pulliam's Patent.

Made of the best steel, and warranted. Will fit wagons of any size. Are attached by four bolts through the bottom of the bed. Lift off the gear with the bed. Designed to remain on the wagon for all kinds of work. Operates equally well whether on a loaded or empty wagon. Saves largely in wear and tear. Removes necessity of spring seat. Affords comfortable riding for from one person to a wagon load.

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Price Lists furnished on application.

PECK & SNYDER'S

Pa ent Self-Adjusting American Club Skate

No. 1.

SIZES: 8—8¼, 9—9¼, 10—10½, 11—11½ inches.

The above are made with blued steel Foot Plates and Clamps, with the best tempered Runner and polished Blades. We make no inferior grade of the American Club Skate, the cheapest No. 1 being as good as the best No. 3, except in point of finish and workmanship.

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No. 2, same as No. 1, only full nickel-plated,	" " 6.00.
No. 3, full polished and bright finished throughout, and nickel-plated,	" " 7.00.

Peck & Snyder's "Clipper" or N. Y. Club Skate.

No. 1.

SIZES: 8—8¼, 9—9¼, 10—10½, 11—11½ inches.

The above Club Skate at the reduced price is now the cheapest Heel Button Skate of the quality in market; quality and make same as the corresponding numbers of the American Club Skate.

No. 1,	Price per pair, $3.00.
No. 2, same as No. 1, only nickel-plated,	" " 4.00.
No. 3, full polished and bright finished throughout, and full nickel-plated,	" " 5.00.

Special discounts to the trade.

Before you order write for our new Skate Catalogue containing list of job lots of Skates.
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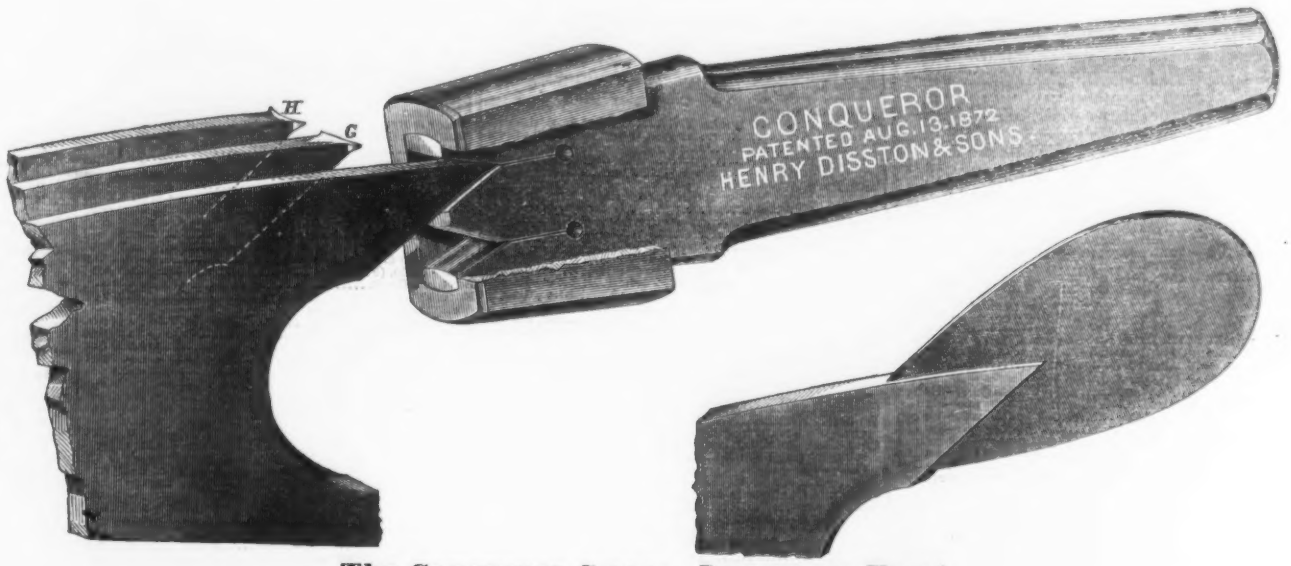
Keystone Saw, Tool, Steel and File Works,

FRONT AND LAUREL STREETS, PHILADELPHIA.

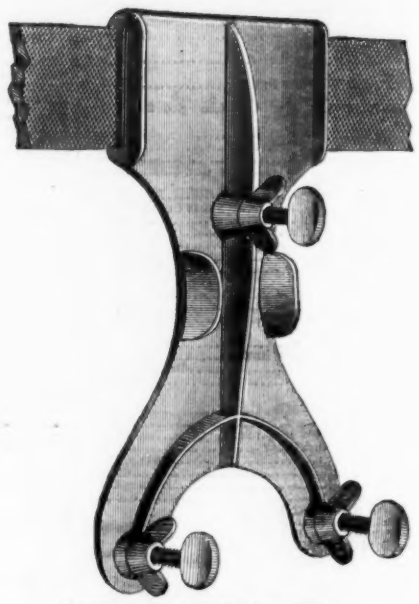
Branch Works, Tacony, Philadelphia. **Branch House, Randolph & Market Streets, Chicago, Ill.**

Disston's Patent Gullet-Tooth Circular Saw.

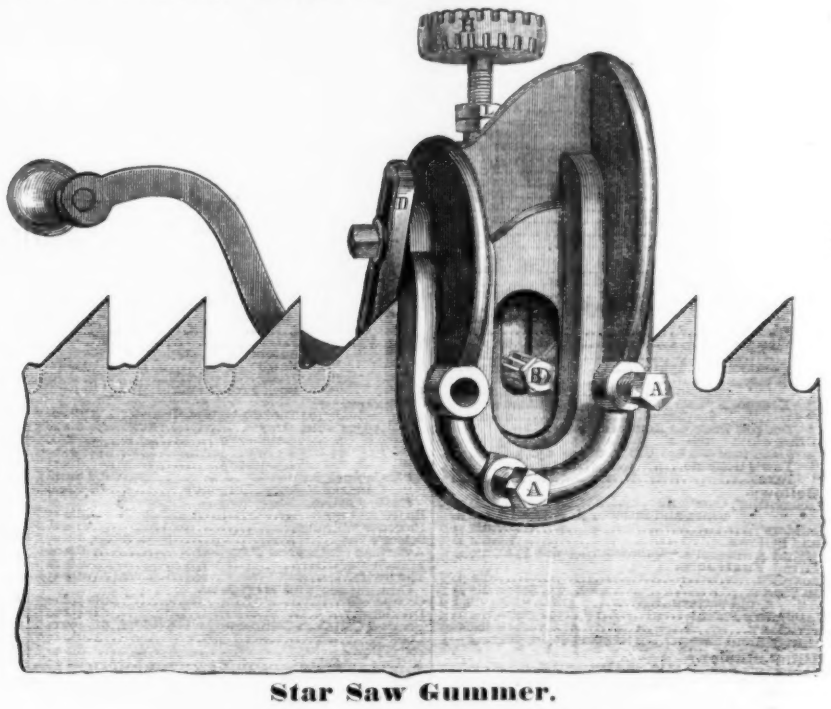


The Conqueror Swage, Jumper or Upset.

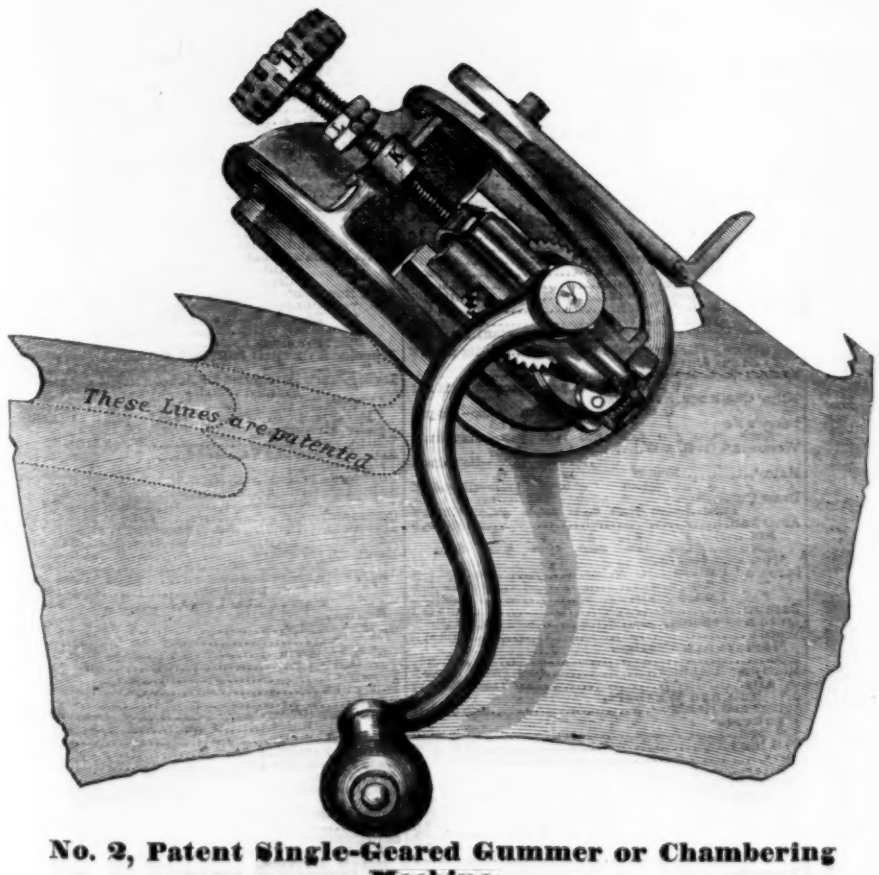
Frame for Holding a Gummer Cutter while being Ground.



Improved Side File.

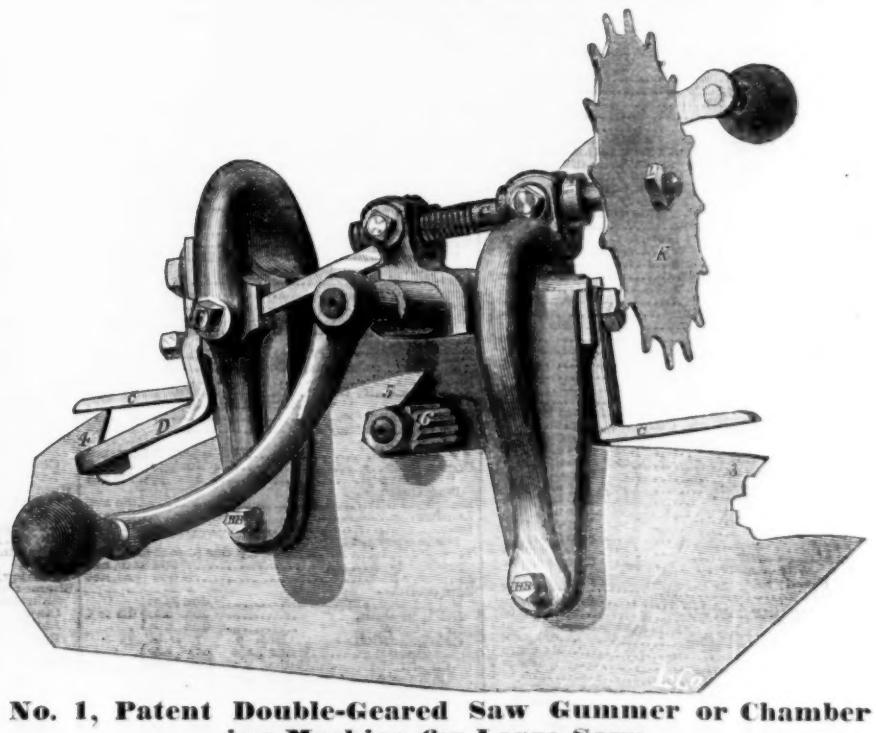


Star Saw Gummer.



No. 2, Patent Single-Geared Gummer or Chambering Machine.

Sampson Saw Set.



No. 1, Patent Double-Geared Saw Gummer or Chambering Machine for Large Saws.

Improved Adjustable Setting Stake for Circular Saws.

New York Wholesale Prices, November 7, 1877.

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American .... ℘ ℔ 15c—dis 20 %
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Cook's, Ives' .... dis 50 %
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Griswold's Patent Bits .... dis 30 %
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Per doz $11.50, 12.00, 12.50 .... dis 15&5 %

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Light or "Common" .... dis 25&10 %
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" Extra Heavy .... dis 40&5&10 %
" White Metal .... dis 60&5 %
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Gong, Abbe's .... dis 20&10 %
" Yankee .... dis 35&10 %
" Barton's .... dis 40&2 %
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" Brook's .... dis 50 %
" Cone's .... dis 10 %
" Connel's .... dis 50&10 %
Lever, Sargent's .... dis 60&10&10 %
" Taylor's Bronze or Plated Lever .... net
" " Japanned Lever .... dis 25&10 %
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" Western .... dis 25&10 %
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" Yaw's Genuine .... dis 50 %
" Texas .... dis 40 %

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Blacksmiths', Common .... dis 30 %
" Extra and Pittsburgh Pattern .... dis 20 %
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Boardman's Patent, ⅜ in. and larger ℘ ℔ 41c. dis 10&5 %
" 5/16 in. .... ℘ ℔ 46c. dis 10&5 %

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Keystone Portable Forge Co .... dis 20 %

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Cast Iron Barrel, Shutter, &c .... dis 60&10&10 %
Cast Iron Chain (Sargent's list) .... dis 60&10&10 %
Bush's Lever Bolts .... dis 40, 10&10 %
Wrought Iron Barrel .... dis 50, 10&10 %
" " Square .... dis 50, 10&10 %
" " Shutter (Stanley's list) .... dis 50 %
" " " (Sargent's new list). dis 50, 10&10 %
" " Sunk Flush, Sargent's .... dis 50&10&10 %
" " " " Stanley's .... dis 15&10 %
" " B.K.Flush, Comm'n, Stanley's. dis 30&10 %
" " " " Ex. Heavy, " dis 20&10 %
" " Plated Knob & Slide Flush " dis 10&10 %
Carriage and Tire, Common .... dis 75&3 % cash
" " Norway Iron .... dis 70 %
" " R. B. & W .... (old list) dis 65&5 %
" " Philadelphia .... dis 60&20 %
" " Coleman .... dis 60&10 @ 60&20 %
" " Shelton's .... (old list) dis 65&5 %
[illegible] (Phila) .... dis 60&10@60&20 %
S[illegible] Nut Company, old list .... dis 60&5 %
U[illegible]—American Screw Co.'s .... dis 45 @ 50 %
Sto[illegible] R. B. & W .... dis 50 %
" [illegible]ton's Shaved Head .... dis 45 @ 50 %
" S[illegible] Nut Co .... dis 45 %
" Un[illegible] .... dis 45 %
Plow, R. B. .... dis 65 %
Machine .... dis 60 %
Bolt Ends .... 12 @ 12½c ℘ ℔

Borax ....

Boring Mach[illegible]ines.	Upright.	Angular.
	$3.75	$5.00 dis 35 %
Hovey's, no Auger	7.00	8.25 dis 35 %
" with Auge[illegible]	5.00	7.50 dis 30 %
Parr's, no Augers	7.50	10.00 dis 30 %
" with Augers	5.25	6.75 dis 15 %
Kellogg's, no Augers	3.25	4.00 net
Sweets'	5.00	6.00 net
" with Augers	4.75	6.25 dis 25 %
Snell's, no Augers	....	10.00 dis 25 %
Phillips' with Augers	....	7.50 dis 40&10 %
Douglass', no Augers	5.50	7.50 dis 40&10 %
" with Augers	9.00	11.00 dis 40&10 %

Bow Pins. .... dis 60&5 %
Union Nut Co .... low list dis 10 %
Hotchkiss' .... dis 60 %
Humason, Beckley & Co.'s .... dis 60&10 %
Sargent & Co.'s .... $19.70 and $21.40, dis 40&5 %

Braces.—Barber's Patent .... dis 50&10 %
O. S. Backus .... dis 10 %
Wilson Mfg. Co .... dis 50 %
Spofford's Patent .... dis 40&5 %
Noble's Patent .... dis 40&10 %
Ives' "Centennial" .... dis 25&10 %
Common Ball (American) .... dis 60&10&10 %

Brackets.—Shelf (Sargent's).. dis 60&10 @ 60&10&10 %
Bright Wire Goods .... dis 70&5&10 %
Bull Rings.—Union Nut Co .... dis 50&20 %
Sargent's .... dis 66⅔&10 %
Hotchkiss' .... low list dis 10 %
Humason, Beckley & Co.'s .... dis 60 %
Union Nut Co .... dis 60&5 %

Butts.
Wrought Brass .... dis 70 % @ —
Cast Brass .... dis 20 %

COMMON CAST, NOT DRILLED.
Fast Joint, Narrow .... dis 50 %
" Broad .... dis 60 %
Loose Joint, Narrow and Broad .... dis 65 %
Parliament Butts and Mayer's Hinges .... dis 60 %
Loose Pin .... dis —
Loose Pin Japanned .... dis —
Loose Pin Jap'd, Plated Tips .... dis —

DRILLED AND WIRED.
Fast Joint, Narrow .... dis 45 %
" Broad .... dis 55 %
" Broad, Japanned .... dis 50 %
Loose Joint .... dis 62½ %
" Japanned .... dis 62½ %
Parliament and Mayer's Hinges .... dis 50 @ 60 %
Loose Pin, no Acorn .... dis 65 %
" Acorns .... dis 62½ %
" " Japanned .... dis 65 %
" " Plated Tips .... dis 62½ %
(10 per cent. extra discount.)

Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint .... dis 60&10 %
Boston Finish, Plain .... dis 80&10 %
" with Iron Acorns .... dis 75&10 %
" with Silvered Acorns .... dis 65&10 %

WROUGHT IRON.
Fast Joint, Narrow .... dis 40&10 %
" Lt. Narrow .... dis 30&10 %
" Broad .... dis 40&10 %
Loose Joint, Broad .... dis 40&10 %
Table Butts, Back Flaps, &c .... dis 35&10 %
Inside Blind, Regular .... dis 35&10 %
" " Light .... dis 40&10 %
Loose Pin, Wrt .... dis 40&10 %
Am. Spiral Spring Butt Co., Japanned .... dis 25 %
" " " Fancy .... dis 10 %
Sabin Mfg. Co., Double Acting .... dis 35 %
Union Spring Hinge Co .... dis 25 %
" Mfg. Co. Spring Hinges .... dis 25 %
Blind Butts, Parker .... dis 60&10 %
" Palmer .... dis 40&10 %
" Seymour .... dis 60&10 %
" Shepard .... dis 60 %
" Lull & Porter .... dis 60 %
" Nicholson .... dis 45&10 %
" Huffer .... dis 33⅓&10 %
" Garretson .... dis 60 %
" Clark's, Nos. 1, 3, 5, 40 and 50 .... dis 60 %
" " Nos. 2, 4, 4½, 6, 8, 10 .... dis
" Sargent's .... dis 70&5&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co .... dis 20 %
D. R. Barton Tool Co .... dis 20 %
Bradley's .... dis 25 %
Beatty's .... dis 25 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Hart Mfg. Co .... dis 50&10 %
0 1 2 3 4 5 6
$20.00 26.00 29.50 33.00 37.00 41.00 45.00

Can Openers.
Messenger's Comet .... ℘ doz $3.00, dis 20 %
American .... ℘ doz $2.25, dis 50&5 %
Lyman's .... ℘ doz $3.75, dis 25 %
No. 4, French .... ℘ doz $2.25, dis 50 %
No. 5, Iron Handle .... ℘ doz $2.25, dis 50&5 %
Sprague's .... Nos. 1 2 3
℘ doz $2.00 2.25 2.50 dis 25 %
Eureka .... ℘ doz $2.50, dis 10 %
Sardine Scissors .... ℘ doz $7.00, dis 40 @ 40&5 %
Star .... ℘ doz $5.00, dis 25 %

Caps—Percussion, ℘ 1000.
Hicks & Goldmark's G. D. & S. R .... 37 @ 40c
" " E. B. 1-10 Ground .... 70c, dis 5 %
" " E. B. 1-10 Turned .... 65c, dis 5 %
" " D. W. P. 1-10 .... $1.40, dis 5 %
" " D. W. P. ¼ .... 1.35, dis 5 %
" " Colt's 1-10 .... 70c, dis 5 %
Ely's E. B .... 1-48, 58c.; 1-108, 70c. gold
" Double Waterproof, 1-48, $1.50; 1-108, $1.58c, gold
Colt's .... 1-108, 80c, gold
Cock's Waterproof 60c

Cartridges.—Metallic .... dis 62½ %
Cards.—Horse and Curry .... dis 30&10 %
Cotton .... dis 10&10 %
Wool .... dis 15&10 %

Carpet Stretchers.
Cast Steel, Polished .... ℘ doz $5.00, dis 30 %
" Iron, Steel Points .... ℘ doz $2.00, dis 45&5 %

Casters.
Bed .... dis 55 %
Plate and Shallow Socket .... dis 55 %
Deep Socket .... dis 40 %

Cattle Leaders.
Hotchkiss' Sons' .... dis 10&10 %
Humason, Beckley & Co.'s .... dis 60 %
Sargent's .... dis 60&10 %
Union Nut Co .... dis 60&5 %

Chain.
Trace, 6½-1-2 .... by the cask, ℘ pair, gold, 45 @ 46c
" 6½-10-3 .... by the cask, ℘ pair, gold, 43 @ 44c
" 7-10-2 .... by the cask, ℘ pair, gold 49 @ 50c
German Halter Chain .... dis 30&5 % gold
" Coil .... dis 30&5 % gold
Galvanized Pump Chain .... ℘ ℔ 10½c dis 10 %
Jack Chain, Iron .... dis 55&10 %
" Brass .... dis 45&10 %

Chalk.
White .... ℘ gross 55c net
Red .... ℘ gross 75c net
Blue .... ℘ gross 90c net
White Crayons .... ℘ gross 13½c net

Chisels.
D. R. Barton Tool Co. (all kinds) .... dis 20 %
Socket Framing, Crossman .... dis 60&5&10 %
" " Buck Bros .... new list, dis 17½ @ 20 %
" " Hart Mfg. Co., No. 1 .... dis 65&5&10 %
" " Merrill .... dis 60&10 %
" " Witherby Tool Co .... dis 60&10 %
" " Douglass' .... dis 70 %
" Firmers, Crossman .... dis 60&10 %
" " Buck Bros .... new list, dis 17½ @ 20 %
" " Hart Mfg. Co., No. 1 .... dis 65&5&10 %
" " Merrill .... dis 60&10 %
" " Witherby Tool Co .... dis 60&10 %
" " Douglass' .... dis 70 %
" Corner .... dis 65&10 %
Tanged Firmers extra .... dis 40 %
" " Butcher's .... $5.00 @ $5.25 to £ gold
" " Newbould's .... 5.50 to £ gold
" " Spear & Jackson's .... 5.00 to £ gold
" " Buck Bros (Shank) .... 5.25 to £ gold

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron .... dis 25 %
" Adjustable, Gray's .... dis 20 %
" " Lambert's .... dis 20 %
" " Snow's .... dis 40&5 %
" " Hammer's .... dis 15 %
" Cabinet, Sargent's .... dis 60&10 %
" Carriage Makers', Sargent's .... dis 60&10 %

Coffee Mills.
Board and Box .... dis 25 %
Increase Wilson's .... dis 25 %
Selsor's Pat .... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) .... dis 20 %
French Steel .... dis 20 %
The Swift .... dis 25 %

Compasses and Dividers.
Compasses .... dis 35&10 %
Dividers .... dis 45&10 %
Bemis & Call Co.'s Compasses and Dividers.. dis 35&10 %
Cook's .... dis 15 %
Excelsior .... dis 40 %
Miller's Patent .... dis 25 %

Coopers' Tools.
Bradley's .... dis 15 @ 20 %
Chas. E. Little .... dis 20 @ 25 %
D. R. Barton Tool Co .... dis 20 %

Corkscrews.—Humason & B .... dis 33⅓ %
Corn Knives and Cutters.—Bradley's.... dis 10
Crow Bars.
Cast Steel .... ℘ ℔ 9c net
Iron, Steel Points .... ℘ ℔ 5c
Crucibles.—Gautier & Co .... ℘ No. 5½c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.40 .... dis 10 %
Curling Tongs .... ℘ doz $6.50, dis 15 %
Pinching Irons .... ℘ doz 7.50, dis 20 %

Curry Combs.
Curry Comb Mfg. Co .... dis 25&10 %
Fitch's (List of No. 240, $1) .... dis 30&10 %
Hotchkiss' & Kellogg's, Iron & Brass, old list. dis 40&7½ %
Hotchkiss' Novelty .... dis 10&10 %
Rubber .... ℘ doz $9.00, dis 15 %
Wood Tooth (Fuller Bros.) .... ℘ doz $2.25, net

Clips, Axle.
Norway or Best .... dis 50 %
Superior .... dis 55 %

Cockeyes.... 1¼ in., 28c.; 1⅜ inch, 33c.; 1½ in., 37c, net

Cocks.
Brass Racking .... dis 50 %
Lock and Globe .... dis 50 %
Lever Bibbs .... dis 50 %
Ale and Beer .... dis 40 @ 45 %

Curtain Pins.—Silvered Glass .... new list, dis 15 %

Cutlery.
Meriden Cutlery Co. (Table) .... net
Am. Miller Bro.'s Cutlery Co .... dis 25 %
Naugatuck Cutlery Co .... list net
New York Knife Co. (Pocket) .... dis 35&5 % cash
" " (Table) .... net
Rogers Cutlery Co .... net
Humason & Beckley Mfg Co .... dis 25 %

Dippers.
Britannia .... ℘ doz $3.75 @ $4.25, net
Cocoa, Plain .... ℘ doz $3.25, dis 20 %
" Rimmed .... ℘ doz 3.75, dis 20 %

Dog Collars.
Embossed Gilt .... dis 20 %
Leather .... dis 30 %
Brass .... dis 25 %

Door Springs.
Torrey's Rod .... ℘ doz $2.00 @ $2.10, net
Gray's .... ℘ doz $2.00, net
Johnson's Rod .... ℘ doz 3.00, net
Gem (Coil)—
No. 1, Large, Japanned .... ℘ doz $3.50 }
No. 2, Medium, " .... ℘ doz 2.50 } dis 10 %
No. 4, Small, " .... ℘ doz 2.00 }
Challenge (Coil)— Nos. 9 7 6
Japanned .... ℘ doz $2.00 2.50 3.50 }
Coppered .... ℘ doz 4.00 4.50 5.00 } dis 15 %
Galvanized .... ℘ doz 3.50 4.00 4.50 }
Nickeled .... ℘ doz 5.50 6.00 7.00 }
Premium (Coil)— Nos. 1 2 3
Japanned .... ℘ doz $7.50 6.25 5.00 } dis 30 %
Nickeled .... ℘ doz 11.00 9.50 8.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 5, Small .... ℘ doz $2.00 }
No. 6, Medium .... ℘ doz 2.50 } dis 15 %
No. 7, Large .... ℘ doz 3.50 }
Philadelphia .... 5 in., $5.00; 8 in., $7.00, dis 30 %
Barker's Concealed .... dis 15 %

Drawing Knives.
Crossman's No. 1 .... dis 60&5&10 %
D. R. Barton Tool Co .... dis 20 %
Hart Mfg. Co., No. 1 .... dis 65&5&10 %
Merrill .... dis 60&10 %
Nobles Mfg. Co .... dis 15 %
Bradley's .... dis 35 %
Adjustable Handle .... dis 20 %
Witherby Tool Co .... dis 60&10 %
Douglass' .... dis 70 %

Drills and Drill Stocks.
Blacksmiths' .... each $2.25 net
" Self-Feeding .... each $7.50, dis 10 %
Breast, P. S. & W .... dis 25 %
Breast, Aiken's .... dis 25&10 %
" Hotchkiss .... dis 10 %
" Wilson's .... dis 20 %
" Miller's Falls .... each $2.50, dis 25 %
Ratchet, Merrill's .... dis 20 %
" Ingersoll's (old list) .... dis 35 %
" Whitney's .... dis 20 %
" Weston's .... dis 20 %
" Moore's Triple Action .... dis 20 @ 25 %
Wilson's Drill Stocks .... dis 10 %
Automatic Boring Tools .... each $2.75, dis 20 %

Drill Chucks.
Danbury .... each $8.00, dis 30 %

Morse's Beach Patent .... dis 30 %
" Adjustable .... each $10.00, dis 30 %

Egg Beaters.
Dover .... ℘ doz $5.00, dis 20 %
National .... ℘ doz $4.50, dis 33⅓ %
Schofield .... ℘ doz $3.50

Emery.
Genuine Chester—Regular Nos .... ℘ ℔ 6c } dis 10 %
" " Flour and FF .... ℘ ℔ 4c }
Washington Mills—Regular Nos .... ℘ ℔ 8c
" Flour .... ℘ ℔ 5c
Wellington Mills, Grain .... ℘ ℔ 10c net
" " Flour .... ℘ ℔ 8c net
Hampden Emery Grain .... 5c net
" " Flour .... 3c net

Enameled and Tinned Ware.
Kettles .... dis 40 @ 50 %
Sauce Pans .... dis 30 @ 35 %
Glue Kettles .... dis 30 @ 35 %
Tinned Sauce Pans .... dis 30 @ 35 %

Escutcheons.
Door Lock .... Same discounts as Door Locks
Brass Thread .... dis 60&10 %
Wood .... dis 25 %

Faucets.
Fenn's .... dis 50 %
Fenn's Cork Stops .... dis 40 %
Star .... dis 55&10 %
Frary's Patent Petroleum .... dis 20&10 %
Wood and Metallic .... dis 40 %
" Cork Lined .... dis 65&10 %
Enterprise Mfg. Co., Self-Measuring .... dis 20 %

Felloe Plates .... ℘ ℔ 15c, dis 50 %

Files.
American File Co .... $5.00 to £ currency, dis 30 %
Nicholson .... (Nicholson List) dis 25 %
Heller & Bros .... $5.00 to £ currency, dis 15 @ 20 %
Madden & Cockayne File Co .... $5.00 to £ cur., dis 25 %
Jowitt's .... $4.50 to £ gold
J. & Riley Carr .... 4.50 to £ gold
Stubs' .... 7.50 to £ gold
Butcher's .... 4.50 to £ gold
Walter Spencer & Co.'s "Diamond" .... 4.50 to £ gold
Fisher's .... 4.75 to £ gold
Moss & Gamble .... 4.75 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.). 4.50 to £ gold
" " Horse Rasps .... 4.75 to £ gold
H. Disston & Sons (new list) .... dis 30 %
Limet & Co. (French) .... $4.25 to £ gold
Boyton's Cant .... dis 40 %
Rothery .... dis 25 %

Fluting Machines.
Mrs. Knox, No. 1876 .... each $2.50 to $2.75 net
Knox Imperial, 1877 .... each $2.50 @ $2.75 net
Knox, 4-inch Rolls .... $2.50 each net
" 6 " " .... $2.75 @ $3.00 each net
" 8 " " .... 4.50 each net
Peerless, 4-inch Rolls .... 4.00 each net
" 5 " " .... 4.75 each net
Improved Knox (Climax), 4-inch .... 2.65 each net
" " " 6 " .... 3.15 each net
" " " 8 " .... 4.00 each net
Eagle, 3½-inch Roll .... $18.00 ℘ doz, dis 5 %
" 5⅛ " " .... 24.00 ℘ doz, dis 5 %
Empire .... $4.00 each net
Eureka, No. 1, 7-inch Roll .... 6.75 each net
" No. 2, 5-inch Roll .... 5.00 each net
Crown, 4½-in. Roll, $2.25; 6-in., $2.70; 8-in., $3.85 each, net
Domestic Fluter .... 1.50 each net
Geneva Hand Fluter .... 15.00 ℘ doz net
Combined Fluter and Sad Iron .... ℘ doz 15.00, dis 10 %

Fluting Scissors .... dis 40&10 %

Forges.
"Empire" .... dis 20 %
Keystone Portable Forge Co .... dis 20 %

Forks.
Hay, Manure and Spading .... dis 35 %
Plated A 1 .... dis 40&5 %
" Reed & Barton .... dis 40&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co .... dis 20 %

Fry Pans.
Burnished, P. S. & W., new list .... dis 60 %
No. 0 1 2 3 4 5 6 7 8
℘ doz... $3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00

Gauges.
Marking .... dis 45&10 %
" Star .... dis 35 %
Wire .... dis 10 %
" Smith's Patent .... ℘ doz $18.00, dis 40 %

Gimlets.
Nail and Spike .... dis 40 %
"Bee" Gimlets .... ℘ gross $12.00, dis 45 %
"Eureka" Gimlets .... dis 40 %
Double Cut, Shepardson's .... dis 30 %
" " Hartwell's .... dis 40 %
" " Ives' .... dis 40&10 %
" " Douglass' .... dis 40 %

Glue Pots.
Tinned and Enameled .... dis 35 @ 40 %
Family, Howe's "Eureka" .... dis 25 %
" L. F. & C.'s "Handy" .... dis 25 %

Grindstone Fixtures.
Sargent's Patent .... dis 70&10&10 %
Reading Hardware Co (New list) .... dis 40&10 %
Hart Mfg. Co., Nos 9 to 11 .... dis 75&7½&10 %
Rick Bros .... dis 45&5 %

Hammers.
Humason & Beckley Mfg. Co .... dis 33⅓ %
Maydole's (New list, Jan. 1, '77) .... dis 15 %
Henry Hammonds' (New list, Jan. 1, '77) .... dis 25 %
Cheney's Steel Face and Claw .... dis 10 %
" all Steel .... dis 20&10 %
Verree .... dis 5 %
Magnetic Tack .... dis 25&10 %
Warner & Noble's .... dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4.00 ℘ pair } dis 25 %
" Leg Irons, $6.50 ℘ pair }
Providence Tool Co.'s Hand Cuffs, $15.00 ℘ doz } dis 10 %
" " Leg Irons, $25 ℘ doz }

Handles.
Door or Thumb Latches—
Nos 0 1 2 3 4
Per doz .... $0.80 1.00 1.18 1.35 1.50 ... dis 60&10 %
Roggin's Latches .... 33c net
Bronzed Iron Drop Latches .... ℘ doz $1.00 @ $1.25 net
Jap'd Store Door Handles—Nuts, $1.80; Plate, $1.20; no Plate, 96c .... net
Wrought Chest .... dis 60&10 %
Surface Chest, Sargent's list .... dis 60&10 %
Flush Chest .... dis 60&10&10 %
Lifting .... dis 60&10 %
Saw and Plane .... dis 25&10 %
Boynton's X Cut (Loop) .... dis 20 %
" " (Centennial) .... dis 15 %
Hammer and Hatchet .... dis 10 %
North Carolina Handle Co .... dis 15 %
Brad Awl .... ℘ gross $3.75, dis 25&10 %
Hickory Firmer Chisel, assorted, ℘ gross $5.25 }
" " " large, " 6.50 }
Apple " " assorted, " 6.00 }
" " " large, " 7.50 }
Socket " " assorted, " 4.50 } dis 40 %
" Framing " assorted, " 7.00 }
File, assorted, ℘ gross .... 3.50 }
Auger, assorted, ℘ gross .... 6.00 }
" large, " .... 7.00 }
Patent Auger, Ives' .... dis 25&10 %
" Douglass' .... ℘ set $1.25, dis 10 %
" Swan's .... ℘ set $1, dis 20&10 %

Hangers.
Barn Door .... dis 70&10 %
"Anti-Friction," No. 1, $1.25; No. 2, $1.50 ℘ pr., dis 40&10 %
Novelty .... dis 40 %
Challenge .... dis 50 %
Climax .... dis 40 %

Harness Snaps.
Henshaw's... List of 1⅛ changed to $14.00, dis 45 @ 50 %
Judd's .... " " " 14.00, dis 50 %
Fitch's (Bristol).. " " " 14.00, dis 45 @ 50 %
Hotchkiss' .... dis 10 %
Andrews' .... dis 45 %
Sargent's .... dis 60&10 %
New York Wire .... dis 20&20 %
"German" .... dis 60 %

Hatchets.
Isaiah Blood .... dis 15 %
Shingling, Nos. 1 2 3 .... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 .... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 .... ℘ doz 7.50 8.00 8.50
Hunt's .... dis 25 %
Shingling, Nos. 1 2 3 .... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 .... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 .... ℘ doz 7.50 8.25 9.00
Hurd's .... dis 30&10 %
Shingling, Nos. 1 2 3 .... ℘ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 .... ℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 .... ℘ doz 8.00 8.50 9.00
Simmons' .... dis 35 %
Shingling, Nos. 0 1 2 3 .... ℘ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 .... ℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 .... ℘ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 .... ℘ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 .... ℘ doz 16.00 18.00 20.00 22.00
Collins' .... dis 10 %
Shingling, Nos. 1 2 3 .... ℘ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 .... ℘ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 .... ℘ doz 6.00 6.50 7.00
Ten Eyck Axe Mfg. Co .... dis 35 %
Shingling, Nos. 1 2 3 .... ℘ doz $8.00 $8.50 $9.00
Lathing, Nos. 1 2 3 .... ℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 .... ℘ doz 9.00 9.50 10.00
Broad, Nos. 3 4 5 .... ℘ doz 13.00 14.50 16.00
" Nos. 6 7 8 .... ℘ doz 18.00 19.50 22.00
" No. 9 .... ℘ doz 25.00
D. R. Barton Tool Co .... dis 20 %
Shingling, Nos. 1 2 3 .... ℘ doz $11.00 $10.50 $10.00
Lath, Nos. 1 2 3 .... ℘ doz 10.50 10.00 9.50
Half Hatchets, Nos. 1 2 3 .... ℘ doz 11.00 10.50 10.00
J. P. Perree & Co .... dis 5 %
Shingling, Nos. 1 2 3 .... ℘ doz $7.00 $7.50 $8.00
Claw, Nos. 1 2 3 .... ℘ doz 7.50 8.00 8.50
Lathing, Nos. 1 2 3 .... ℘ doz 7.00 7.50 8.00
Underhill's .... dis 20 %
Shingling, Nos. 1 2 3 .... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 .... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 .... ℘ doz 12.00 11.00 13.00
M. H. Jones & Co .... dis 25 %
Shingling, Nos. 1 2 3 .... ℘ doz $8.00 $8.50 $9.00
Half Hatchets, Nos. 1 2 3 .... ℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 .... ℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 .... ℘ doz 8.00 8.50 9.00
Broad, Nos. 2 3 4 .... ℘ doz 11.00 13.00 14.50
" Nos. 5 6 7 .... ℘ doz 16.50 18.00 19.50
Empire Hatchets, M. H. Jones & Co .... net
Shingling, Nos. 1 2 3 .... ℘ doz $4.75 $5.00 $5.25
Lath Nos. 1 2 3 .... ℘ doz 4.75 5.00 5.25
Half Hatchets, Nos. 1 2 3 .... ℘ doz 4.75 5.00 5.25
All pol. Sh'gling, Nos. 1 2 3 .... ℘ doz 5.25 5.50 5.75
Solid Steel Lath, Nos. 1 2 3 .... ℘ doz 7.25 7.50 7.75

Hay Knives.
"Lightning" .... ℘ doz $20.00 net
Wadsworth's .... dis 30 %

Hinges.
Gate, Western .... ℘ doz $6.25, dis 60&10 %
" N. E .... ℘ doz $10.13, dis 60&10 %
" N. Y. State .... ℘ doz $7.20, dis 60&10&10 %
" Clark's No. 1 .... ℘ doz $6.00, dis 45 %
" Automatic .... ℘ doz $12.50 dis 20&10 %
Rolled Plate .... dis 60&10 %
Rolled Raised .... dis 60&10 %
Wrought Strap and T .... dis 60&— %
Providence Plate { 6 to 10 in. 11c ℘ ℔ / over 10 in. 9½c ℘ ℔ } .. dis 40&10 %
Screw Hook and Strap .... { 8, 10, 12 in., 11c / 14 to 36 in., 9½c } dis 40&10 %
Heavy Welded Hook .... { 8 to 12 in., 11 c / 14 in. & up, 9½c } .. dis 30 %
Screw Hook and Eye .... { ⅜ to 1 in., 11 c / 5/16 in. 12½c / ¼ in. 13 c } .... net

Hoes.
Solid Shank, C. S .... ℘ doz $8.00, dis 40 %
Socket .... ℘ doz 9.00, dis 40 %
Riveted Eye .... ℘ doz 4.75, dis 40 %
Grub .... dis 30 %
Planters' .... dis 20 @ 25&10 %
Scovill Pattern .... dis 20 @ 30 %
Lane's C. S. Crescent Planters, Amer. Pat'n.. dis 20&5 %
" Scovill Pattern .... dis 20 %
Handled Solid C. S. Shank .... dis 35 %
Planters', Handled .... dis 35 %
Scovill Pattern, Handled .... dis 35 %
Hick's Pat. Solid C. S. Planters' .... dis 20&10 @ 30 %
" " " Scovill Pattern... dis 20&5 @ 25 %

Hooks.
Bird Cage, Sargent's list .... dis 60&10 %
Cotton .... dis 50 %
Belt .... dis 70 %
Bench—Hotchkiss' $5.00 ℘ doz .... dis 10 %
" Weston's, No. 1, $8.00; No. 2, $7.00 ℘ doz dis 5 %
" McGill's, $3.00 ℘ doz .... dis 10 %
" Skinner's, $6.25 per doz .... dis 20 %
Clothes Line, Hart's list .... dis 60&10&5&10 %
" " Sargent's list .... dis 60&10&10 %
" " Reading list .... dis 33⅓&5&10 %
Ceiling.. / Harness. { Hart's list .... dis 70&10 %
{ Sargent's list .... dis 60&5&10 %
{ Reading list .... dis 40&10 %
Coat and Hat, Hart's list .... dis 65&5&10 %
" " Sargent's list .... dis 60&10&10 %
" " Reading .... dis 40&10 %
Wrought Staples and Hooks and Staples .... dis 75 %
" Staples, Stanley's list .... dis 40 %
Wire Screw Hooks and Eyes .... dis 70&5&10 %
Grass .... dis 30 %
Whiffletree—Patent .... dis 40 %
Hooks and Eyes—Malleable Iron .... dis 60&10&10 %
" " Brass .... dis 60&10&10 %

Horse Nails .... dis 15@25 %

Nos.	5	6	7	8	9	10
Ausable .... ℘ ℔	30c	27c	25c	24c	23c	22c
" P't'd and Pol'd.	31c	28c	26c	25c	24c	23c
" " and Blued	31c	28c	26c	25c	24c	23c
Cortland	29c	26c	24c	23c	22c	21c
" P't'd & Blued.	31c	28c	26c	25c	24c	23c
Buffalo Forged	31c	28c	26c	25c	24c	23c
Globe, P't'd and Pol'd.	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin.	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin.	30c	27c	25c	24c	23c	22c
Perkins' P't'd—Black	26c	23c	21c	20c	19c	18c
Perkins' Pointed and Polished	27c	24c	22c	21c	20c	19c
Perkins' Pointed and Blued	27c	24c	22c	21c	20c	19c
Putnam Hammer, P't'd	32c	28c	26c	25c	24c	23c
Vulcan P't'd & Blued	31c	28c	26c	25c	24c	23c
North Western Plain	30c	27c	25c	24c	23c	22c
" " Fini'h'd	31c	28c	26c	25c	24c	23c

Horse Shoes.—Burden .... ℘ keg $4.02½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy .... ℘ keg 4.02½
Mule Shoes .... ℘ keg 5.02½
Perkins' Snow .... ℘ keg 5.02½
The Boston Horse Shoe .... ℘ keg 5.00

Ice Awls, Chisels, &c.
American Ice Chisel .... ℘ doz $6.50 net
National " .... ℘ doz $6.50, dis 10 %
Novelty Ice Breakers .... ℘ doz $6.50 net
White's Sliding Head Picks .... ℘ doz $2.50 dis 25 %
Dunlap's Ring Picks .... ℘ doz 3.00, dis 20 %
Wood Head Picks, Sargent's .... ℘ doz $1.85, dis 60&10 %
Iron " " .... ℘ doz 1.85, dis 60&10 %
Ice Mallets, Pick in Head .... ℘ doz $1.75 net
" Pick in Handle .... ℘ doz 3.00 net
Ice Axes, Small, Cast or Malleable .... ℘ doz 1.50 net
Kitchen Ice Tongs .... ℘ doz 2.25 net

Kettles.
Brass .... ℘ ℔ 45c net
Enameled .... dis 55 %

Knives.
Ames' Butcher Knives .... dis 20 %
" Shoe " .... dis 15 %
" Bread " .... ℘ doz $1.50, dis 15 %
Hay and Straw—"Wadsworth's" .... dis 30 %
Table and Pocket .... See Cutlery

Knobs.
Carriage (Jap'd 80c. ℘ gross) .... dis 60&10 %
Base—Common .... dis 30&10 %
" Plush Tip .... dis 10 %
" Elastic End, No. 8 .... dis 60&5 %
Door, Mineral / " Por. Jap'd / " " Plated / " Por. } Same discounts as Door Locks.
Furniture, Plain .... 75c gross inch, dis 10 %
" Wood Screws .... dis 20 %

Ladles.
Melting—Hart's .... dis 55&10 %
" Sargent's .... dis 50&10 %
" Reading .... dis 15&10 %
" Monroe's Patent .... ℘ doz $4.00, dis 20 %

Lanterns.
Tubular .... No. 0, $10.00; No. 1, $12.50 / With Guards, 50c extra. } net
Hurricane .... dis 25 %
Peerless .... No. 5, ℘ doz $11.75, dis 10&10 %
Brady's Patent .... dis 10&10 %
Ætna .... dis 10&10 %
Yankee .... dis 10&10 %
De Beque .... dis 10&10 %
Police.. Small, $7.50; Med., $9.00; Large, $12.00, dis 15@20 %

Lard Presses.
Draw Cut, 14 inch .... each $65.00, dis 20 %
Enterprise Mfg. Co .... dis 20 %

Lemon Squeezers.
Porcelain Lined .... ℘ doz $6.00 net
Eureka, Tinned .... ℘ doz $10.00, dis 10 %
Dunlap's Improved .... ℘ doz $6.00 net
Sammis' Patent.... No. 1, $7.50; No. 2, $12.00 ℘ doz .... dis 25&

Lines.—Linen Fish .... dis 25
Cotton Chalk .... dis 50 %
Sil. Lake Chalk.... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 .... dis 20 %
Mason's .... dis 20 %
Wire Clothes, Gal d .... each 43 @ 50c net

Locks and Latches.
Cabinet—Gaylord / " Eagle } .... dis 25&2 %
Trunk .... dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key .... dis 40&10 %
Flat Key .... dis 33⅓&10 %
Barnes & Deitz, Flat Key .... dis 30 %
Yale Lock Co., Flat Key .... dis 40 %
Sargent & Greenleaf, Flat Key .... dis 35 @ 40 %
Shepardson's, Flat Key .... dis 35 %
American Lock Mfg. Co .... dis 33⅓ %
Plate .... dis 33⅓&5&2 %

DOOR LOCKS, &C.
Branford .... dis 60&10&2 %
Norwalk .... dis 50&10&2 %
Russell & Erwin .... dis 60&10&2 %
Mallory, Wheeler & Co .... dis 35&10&2 %
Padlocks—Russell & Erwin / " Mallory, Wheeler & Co / " Wm. Wilcox & Co } .... dis 33⅓&5 % and 2 % for cash
" American Lock Mfg. Co .... dis 33⅓ %
" Romer's .... dis 20 %
" Vulcan Hardware Co .... dis 20 %
" New York Lock Co .... dis 20 %
" J. H. McWilliams .... dis 10 %
" Barnes & Dietz .... dis 30 %
" Miller's Patent .... dis 50 %
" Penn Lock Works .... dis 33⅓ %
" " " (Scandinavian) .... dis 50 %

Mallets.—Hickory and Lignumvitæ .... dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
℘ doz.. $14.00 17.00 19.00 30.00—dis 25 %
Miles' Challenge .... Nos. 1 2 3
℘ doz.. $22.00 30.00 40.00—dis 30 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each.. $3.00 4.00 5.00 11.00 13.00 36.00—dis 20&10 %
Woodruff's (P. S. & W.) .... Nos. 100 150
℘ doz.. $15.00 18.00—dis 20&10 %
Hales' .... Nos. 11 12 13
℘ doz.. $33.00 40.00 51.00—dis 50&2 %
Draw Cut .... Nos. 5 2 6 8 10
Each.. $50.00 75.00 80.00 225.00 400.00—dis 20 %
American .... dis 25 %
Nos .... 1 2 3 4 B 5
Each $5.00 7.00 10.00 25.00 50.00 60.00

Molasses Gates.
Stebbins' Pattern .... dis 62½&10 %
" Genuine .... dis 60&10 %
" Tinned Ends .... dis 40&10 %
Bush's .... dis 20 %
Lincoln's Genuine .... dis 62&10 %
Weed's .... dis 15 %

Mortars and Pestles.
Iron .... net
Mortising Machines .... each $20.00, dis 20 %

Nails .... See Trade Report

Nuts and Washers.
Square and Hexagon .... 7¾c off list

Oakum.
Best .... ℘ ℔ 10½c
U. S. Navy .... ℘ ℔ 9½c
Navy .... ℘ ℔ 8½c

Oilers.
Zinc and Tin .... new list, dis 45 %
Brass and Copper .... new list, dis 40 %
Olmsted's .... dis 40 %
Broughton's .... dis 33⅓ %
Malleable .... ℘ doz $5.00, dis 10 %
Prior's Patent or "Paragon" .... dis 45 %

Ox Balls .... dis 60&10 %

Pencils.
Faber's Carpenters' .... dis 10 %
" Round Gilt .... ℘ gross $6.00 net
Dixon's Lead .... ℘ gross 4.50 net
" Lumber .... ℘ gross 9.00 net

Picture Nails and Knobs.
Brass Head, Sargent's List .... dis 60&10 %
Porcelain Head " .... dis 60&10&10 %
" " Judd's List .... dis 40 %

Pinking Irons .... ℘ doz $2.75, dis 65&5&10 %

Plaiting Machines.
Astor Plaiting Machine .... each $15.00, dis 20 %

Planes and Plane Irons.
First Quality .... dis 35@40 %
Second " .... dis 50&10 %
Bailey's Patent Adjustable, new list Jan. '77, dis 25&10 %
Bailey's "Victor" " " .... dis 25&10 %
Defiance Adjustable, new list .... dis 25&10 %
D. R. Barton Tool Co .... dis 20 %
Sandusky .... dis 35 %
Ohio Tool Co .... dis 35 %
Plane Irons, Butcher's .... $5.50 to £ gold
" Buck Bros .... $5.25 to £ gold
" Bailey's Patent .... dis 25&10 %
" Auburn Tool Co.'s .... dis 25 %
" Greenfield Tool Co .... net list
" Defiance .... new list dis 25&10 %
" D. R. Barton Tool Co .... dis 20 %
" Middletown Tool Co .... dis 10 %
" Ohio Tool Co .... dis 10 %
" Spear & Jackson's .... $5.00 to £ gold
" Sandusky Tool Co .... dis 10&10 %
Plow Bits, Greenfield Tool Co .... dis 10 %

Pliers and Nippers.
Button's Patent .... dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ℘ doz, dis 25 %
Gas Pliers .... dis 30&10 %
Eureka Pliers and Nippers .... dis 25 %
P. S. & W. Cast Steel .... dis 20 %

Plumbs and Levels.
Stanley R. & L. Co.'s Pat. Adjustable .... dis 60&10 %
" " " Non-Adjustable .... dis 60&10 %
Chapin's .... dis 60&10 %
Standard Rule Co.'s New Adjustable .... dis 60&10 %
" " Non-Adjustable .... dis 60&10 %
Johnson's Patent Adjustable .... dis 60&10 %
Davis' Patent .... dis 60&10 %
Pocket Levels .... dis 60&10 %

Post Hole and Tree Augers.
Eureka Digger .... ℘ doz $40.00, dis 20 %
Fletcher Post Hole Augers .... ℘ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz .... dis 20 %
Leed's .... $5.00 each, dis 35 %

Potato Parers, &c.
Bay State .... ℘ doz $12.00 net
"Saratoga" Peeler and Slicer .... ℘ doz 9.00 net

Pulleys.
Judd's Axle .... ℘ doz $0.50, dis 20&10 %
Hot House and Tackle .... dis 60&10 %
Jap'd Screw .... dis 60&10 %
Brass Screw .... dis 60&10 %
Jap'd Side .... dis 60&10 %
" Clothes Line .... dis 60&10 %
Hay Fork .... Solid Eye, $4.50; Swivel, $5.00, dis 40 %

Pumps.
Douglas Cistern, etc .... new list dis
" S. & F .... new list dis
Union Mfg. Co.'s Cistern and Pitcher .... dis 35 %
" " " Rams .... dis 25 %
" " " Garden Engines .... dis 20 %

Punches.
Belt or Drive .... ℘ doz $2.00; 2.25; 2.50, dis 30 %
Spring .... ℘ doz $6.50, dis 25&10 %
" Leach's Patent .... dis 15 %
" Bemis' .... dis 20 %
Solid, Tinners' .... ℘ doz $1.44, dis 20 %

Rail.
Sliding Door, Wrought Brass .... ℘ ℔ 40c net
" " Iron, Painted.. ℘ foot 9c, dis 55&10 %
Barn Door, ½, ⅝ and ¾ inch .... dis 65&10 %
" for N. E. Hangers .... dis 65&10 %

Rakes.
Cast Steel .... dis 35 %
8 10 12 14 teeth.
$8.00 9.00 10.00 11.00
Malleable .... dis 40 %
9 10 11 12 13 15 teeth.
$5.00 5.50 5.50 6.00 6.00 6.50

Razor Straps.
Evans' .... dis 40 %
Imitation Emerson .... ℘ doz $2.75, dis 40&10 %
Hunt's .... dis 40&5 %
Chapman .... dis 10 @ 15 %
Torrey's .... dis 20 %
Saunder's .... dis 10 @ 15 %

Rivets.
Iron and Tinned .... dis 40 %
In bulk .... dis 30 %
Copper Rivets and Burs .... dis 10 %
Nos.. 7 8 9 10 11 12 13 14 15
℘ ℔.. 49c 50c 52c 54c 56c 58c 60c 65c 70c

Rivet Sets .... dis 20 %

Road and Levee Scrapers.
Doty's Revolving .... dis 25 %

Rods.
Stair .... dis 50 %
" American Patent .... dis 33⅓ %

Rollers.
Barn Door .... revised list dis 65&10 %
Novelty .... dis 10 %
Acme (Anti-Friction) .... dis 10 %

Rope. Manufacturers' List of Oct. 3, 1877.
Manila .... ½ inch and larger ℘ ℔ 13½c
" .... ⅜ inch ℘ ℔ 14 c
" .... ¼ and 5-16 inch ℘ ℔ 14½c
" Tar'd Rope .... ℘ ℔ 13 c
" " Lath Yarn .... ℘ ℔ 14½c
" Hay Rope .... ℘ ℔ 13½c
Sisal .... ½ inch and larger ℘ ℔ 11½c
" .... ⅜ inch ℘ ℔ 12 c
" .... ¼ and 5-16 inch ℘ ℔ 12½c
" Hay Rope .... ℘ ℔ 11½c

Rules.	Boxwood.	Ivory.
Chapin's	dis 50&10 %	dis 40&10 %
Stanley	dis 50&10 %	dis 40&10 %
Standard	dis 50&10 %	dis 40&10 %
Stephens'	dis 50&10 %	dis 40&10 %
Willis, Thrall & Son	dis 50&10 %	dis 40&10 %

Sad Irons.
From 4 to 10 lbs .... ℘ ℔ 2⅜c net
Sad Iron, Nickel Stand attached .... ℘ ℔ 9c
Self-Heating .... ℘ doz $9.10 @ 9.25 net
" Tailors' .... ℘ doz $19.00 net
Enterprise Patent Cold Handle .... dis 40 %
Combined Fluter and Sad Iron.. per doz $15.00, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½.. $4.25 ℘ ream }
" " " 2, 2½ & 3. 4.75 ℘ ream }
" " " Assorted 4.25 ℘ ream } dis 15 %
" " " Star .... 3.25 ℘ ream }
" " " Emery.. ℘ ream $6.50 @ 11.50 }
New England, same list as B. & A. Flint .... dis 15 %
H. B. & M. Roman Flint " " " .... dis 15&5 %

Sash Cord.
Common .... ℘ ℔ 16 @ 18c net
Patent .... ℘ ℔ 19c net
Silver Lake Russia Flax .... ℘ ℔ 55c net
" White Cotton .... ℘ ℔ 55c net
" Drab Cotton .... ℘ ℔ 60c net
Raw Hide .... dis 25 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross .... dis 33⅓ %
Ferguson's .... dis 33⅓ %
Norwich .... dis 25 %
Walker's .... dis 10 %
New England .... dis 20 %
Hammond's Window Springs .... dis 25 %
Northup Window Springs .... $9.00 per gross, dis 10 %

Sash Weights.—Solid Eyes .... ℘ ℔ 1¼c

Sausage Stuffers or Fillers.
Miles .... ℘ doz $20, dis 30 %
Perry .... ℘ doz, No. 11, $15; No. 10, $21, dis 30 %
Draw Cut No. 4 .... each $30.00, dis 20 %
Enterprise Mfg. Co .... dis 20 %
Silver's .... dis 25 %

Saw Frames .... per gross $18.00, dis 15&10 %
Saw Rods .... $10 list, dis 10&10 %

Saws.
Spear & Jackson's .... $3.50 to £ gold
Disston's Circular .... dis 25 %
" Mill .... dis 30 %
" Cross Cut .... dis 20 %
" Hand, Panel, Rip, &c .... dis 20 %
H. W. Peace's Circulars .... dis 25 %
" Mill, Gang and Mulay .... dis 25 %
" Cross Cut, Wood, Hand, &c .... dis 20 %
E. M. Boynton's Lightning, Cross Cuts .... dis 50&5 % }
" One-Man, all lengths .... dis 40&5 % }
" Buck Saws (X Bar).. ℘ doz $15, dis 40&10 % } 5 % cash.
" Billet Webs .... ℘ doz $10, dis 40&5 % }
" Pruning .... dis 40 % }
Wheeler & Clemson Mfg. Co.'s Hand .... dis 15 %
" " " Cross-Cut .... dis 30 %
Livingston's Butcher and Kitchen .... dis 20 @ 25 %
" Framed Wood—
Nos 101 102 103 104 105
Per doz.. $10.00 8.50 10.00 7.50 6.25 net

Saw Frames.
White, Vermont .... ℘ doz $1.35, dis 15 %
Red, Polished and Varnished .... ℘ doz $2.00, dis 15 %

Saw Sets.
Boynton's Patent .... dis 40 %
Stillman's Genuine .... ℘ doz $4.25 net
" Imitation .... ℘ doz $3.25, dis 25 %
Common Lever .... per doz $2.00, dis 25 %
Leach's .... No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's .... No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss .... $5.50, dis 10 %
" Bemis & Call's .... dis 20 %
" Aiken's Genuine .... $13.00, dis 33⅓&10 %
" " Imitation .... $7.00, dis 40 %
" Hart's Patent Lever .... dis 20 %

Scales.
Hatch, Counter .... ℘ doz $36, dis 40 %
" Tea .... ℘ doz $15, dis 40 @ 45 %
Union Platform .... $6.00, $7.00, dis 45 %
Turnbull's .... dis 20 @ 25 %
Brown's .... dis 25&5 %
Fairbanks' .... dis 20&5 %
Howe's .... dis 20&5 %
Chatillon's Grocers' .... dis 25 %
" Eureka .... dis 20 %
Universal Family .... dis 25 %
Favorite Family .... dis 25 %
Scale Beams, new list .... dis 25 %

Scrapers.
Box, 1 Handle .... ℘ doz $5.00, dis 10 %
" 2 " .... ℘ doz 6.00, dis 10 %
Defiance Box and Ship .... dis 25&10 %
Foot .... dis 60&10 %
Ship (common) .... per doz $3.00 net
" (Providence Tool Co .... dis 10 %

Screw Drivers.
Hart, Bliven & Mead, new list .... dis 45&10 %
Douglass Mfg. Co .... dis 35&10 %
Disston's .... dis 45 %
Stanley Rule & Level Co., No. 1 .... dis 35&10 %
" " " No. 2 .... dis 45&10 %

Screws.
Flat H'd Iron list Sept. 1, '75, R. & E. Mfg. Co. dis 60&10 %
" " " Am. Sc. Co.... dis 60&10 %
Round Head Iron " ......dis 50 %
Flat Head Brass, list Sept. 1, '75, Am. Sc. Co.....dis 55 %
Round Head Brass, list Sept. 1, '75, Am. Sc. Co...dis 40 %
Brass and Silver Capped.........dis 40 %
Lag or Common Coach, new list Mch. 1, '76.dis 65 @ 70 %
Coach, Patent Gimlet Point, list Jan. 1, '75.dis 40 @ 50 %
Bed.........dis 10 %
Japanned, list of Plain Screws.........dis 45 %
Machine, Flat Head, Iron, Am. Screw Co.......dis 10 %
" Round Head, Iron, " " ....net
Nettlefold's Brass.........dis 60 @ 60&5 %
Bench, Iron.........dis 60&10&10 %
" Wood, Beach.........⅌ doz $3.00, net
" " Hickory.........dis 20&10 %
Hand.........dis 25&10 %
Hand Rail, Sargent's.........dis 60&10 %
" " Humason, Beckley & Co.'s.........dis 40&5 %
Jack, Bell Bottom.........dis 20 %

Scythes.

Blood's German Steel, Grass.....	⅌ doz	$10.00	dis $1.50 from list
" Cast, " "	⅌ doz	11.00	
" Silver " "	⅌ doz	12.00	
" German " Grain.....	⅌ doz	14.00	
" Cast " "	⅌ doz	15.00	
" Excelsior and Granger..	⅌ doz	11.00	dis $1.50 from list
" Young America.........		10.50	
" Silver Clipper.........		13.00	

Wadsworth's Grass.........dis 30 %
" Bush.........dis 20 %
Scythe Snaths.........dis 20 %

Shears and Scissors.
Cast Steel.........dis 75 & 10 %
" Iron.........dis 45 %
Seymour's Straight Trimmers.........dis 65 %
" Scissors.........dis 50 %
Pruning.........⅌ doz $5.50 @ $6.00, net
Barnard's Lamp Trimmers.........⅌ doz $3.75

Sheaves.
Sliding Door, M. W. & Co., list.........dis 35&10&2 %
" R. & E. list.........dis 50&2 %
" Patent Roller.........dis 25&2 %
" " " Hatfield's.........dis 50&2 %
" Russell's Anti-Friction.........dis 50&2 %
Sliding Shutter, R. & E. list.........dis 50&2 %
" " Sargent's list.........dis 55&10 %
Moore's Anti-Friction.........dis 33⅓ %

Shovels and Spades.
Ames.........dis 30 %
Rowland's.........dis 50 %
Kimball Shovel Co.........dis 20 @ 20&5 %
Old Colony.........dis 30 %
Middleboro' Shovel Co.........dis 30 %
Remington's (Lowman's Patent).........dis 30 %
Dunning's Shovels and Scoops.........dis 20&7½ %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.........dis 50&2 %
" " Hart's.........dis 55&10 %
Polished Steel.........dis 50&2 %

Slates.
Square Frames, Round Cornered, by case.......dis 70 %
Less than a case.........dis 65&10 %

Spokes.
North Carolina Handle Co.........dis 20 %

Spoke Shaves.
Defiance Metallic.........new list, dis 25&10 %
Iron.........dis 33⅓&10 %
Wood.........dis 30 %
Bailey's.........dis 25&10 %

Spoke Trimmers.
Bonney's.........⅌ doz $10.00, dis 40 %
Stearn's.........⅌ doz $10.00, dis 40 %
Ive's.......No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 40&10 %
Douglass'.........⅌ doz $9.00, dis 20&10 %

Spoons.
Tinned Iron.........dis 10 %
By the case.........dis 20 %
Basting.........dis 10 %
Britannia.........dis 55 @ 60 %
" Boardman's.........dis 55 %
Derby Silver Co.........dis 40&5 %
Rogers & Bro., A 1.........dis 40&5 %
Reed & Barton.........dis 40&5 %
Rogers Cutlery Co.........dis 40&5&5 %
Hall & Elton.........dis 40&5 %
Holmes, Booth & Haydens.........dis 40&5 %
German Silver (Hall & Elton).........dis 25 %
Tin (P. S. & W.), Teas.........$1.50 ⅌ gross, net
" " Tables.........$2.50 ⅌ gross, net
Tin (Cowles Hdw. Co.).........dis 10 %
" " " case lots.........dis 20 %

Stocks and Dies..........dis 5&10 %

Stone.
Hindostan Stone.........⅌ ℔ 6c } dis 25&10 %
" Ax Stone.........⅌ ℔ 8c }
" Slips.........⅌ ℔ 10c }
Sand Stone.........⅌ ℔ 6c, dis 25&10 %
Washita Stone.........No. 1, ⅌ ℔ 30c, net
" ....No. 2, ⅌ ℔ 25c, net
" Slips.........No. 1, ⅌ ℔ 60c, net
Arkansas Stone.........No. 1, ⅌ ℔ $2.00, net
" Slips.........No. 1 ⅌ ℔ $2.50, net
Grindstones, Family, Loring's.........dis 10 %

Stove Polish.
Joseph Dixon's.........⅌ gross $6.00, dis 5 %
Gem.........⅌ gross $4.50, dis 5 %
Gold Medal.........⅌ gross $6.00, dis 25 %
Rising Sun.........⅌ gross $5.75, net

Squares.
Steel.........dis 50 %; full cases, dis 50&10 %
Iron.........dis 50 %; full cases, dis 50&10 %
Nickel Plated.........add $2.50 @ $4.00 ⅌ doz, net
Try Squares and T Bevels.........dis 45&10 %
Star Try Squares and Bevels.........dis 35 %
Disston's Try Squares No. 1.........dis 30 %
" " No. 2.........dis 45 %
" " Improved, Nos. 1 and 2...dis 30 %
Winterbottom's Try and Miter.........dis 20&10 %

Tacks, Brads, &c.—List of January 1, 1870.
Tacks, Half Weight, American.dis 75&20 }
" Full " ....dis 50&20 }
" Half " Swedes.....dis 65&20 }
" Full " " ....dis 30&20 }
" Tinned.........dis 30&10 } dis 10 % for cash
" Carpet, Am. and Swedes..dis 20&20 }
" " Leather Head.........dis 20 }
" " Tinned.........dis 40&10 }
" Copper.........52c, dis 20 }
Brads, Half Weight.........dis 50&20 }
Shoe Nails—
4-8ths and longer, 9c; 3½-8ths, 9½c ⅌ ℔, dis 20&10 %
Trunk, Clout and Finishing Nails—

⅛	⅜	⅝	⅞	1	1¼ in. and over.
25	20	17	15	13	11c ⅌ ℔, dis 20&10 %

Double-Pointed Tacks.........dis 40&5 %

Tap Borers.
Common and Ring.........dis 20&10 %
Ives' Tap Borers.........dis 10&10 %
Enterprise Mfg. Co.........dis 20 %

Tapes, Measuring.
American Flask and Cap Co.........dis 20 %
Eddy's.........dis 20 %
Spring Tapes.........dis 25&10 %

Tea Trays.
American Tea Tray Co.........dis 15 %

Thermometers.
Tin Case.........dis 60&5&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).........dis 20 %
Wood Bottom.........⅌ doz $12.00, dis 30&10 %
All Iron.........⅌ doz $10.50, dis 40&5 %
Nashua Lock Co.'s.........⅌ doz $18.00, dis 50 %

Toe Calks.
Winsted.........⅌ ℔ 10c. dis 5 @ 7½ %

Tinners' Tools and Machines.
P. S. & W.........dis 20 %

Traps.
Game, Newhouse.........dis 30 %
" Newhouse Pattern.........dis 60 %
" Blake's Patent.........dis 40&10 %
Mouse, Wood, Choker.........⅌ doz holes, 13½c
" Patent Choker (Union Nut Co).........⅌ doz holes, 16 @ 18c, net
" Round Wire.........⅌ doz $1.50, dis 10 %
" Cage.........⅌ doz $2.50, dis 10 %
" Patent Self Setting.........⅌ doz holes, 25c, net
" Catch-em-alive.........⅌ doz $3.50, net

Trowels.
Lothrops Brick and Plastering.........dis 10 %
Disston's Brick and Plastering.........dis 20 %
Peace's Plastering.........dis 20 %
Clement & Maynard's.........dis 20 %
Rose's Brick.........dis 15 %
Brades' Brick.........gold, dis 20 %
Worrall's Brick and Plastering.........dis 20 %
Garden.........dis 25 %

Triers.
Butter and Cheese.........dis 25 %

Vises.
Solid Box, Trenton.........40 to 160 lbs., 12½c, net
" Wilson's.........{ 30 to 160 lbs., 18c, / 160 and over, 22c, } ..dis 35 %
" Peter Wrights.........15½c, gold
Parallel, Parker's.........dis 20 %
" Wilson's.........dis 40 %
" Sargent's.........dis 60&10 %
" Trenton.........dis 25 %
" Backus and Union.........dis 25 %
" Merrill's.........dis 15 %
" Fisher & Norris.........dis 15&10 %
" Buffalo.........dis 25 %
" Stevens'.........dis 25 %
" Simpson's Adjustable.........dis 25 %
Saw Filers, Bonney's.........⅌ doz $24.00, dis 20&10 %
" Stearn's.........dis 20&10 %
" Hopkins'.........⅌ doz $17.00, dis 10 %

Washer Cutters.
Smith's Patent.........⅌ doz $12.00, dis 10 %
Johnson's.........⅌ doz $12.00, dis 25 %
Penny's.........⅌ doz $14.00 and $16.00, dis 20 %
Appleton's.........⅌ doz $8.00, dis 10 %
Washers.—See Nuts and Washers.
Well Wheels.—Revised list.........dis 60&10 %

Wire.
Brass and Copper.........List of Jan. 1, 1877, dis 10 %
Bright and Annealed.........Nos. 0 @ 18, dis 55 @ 57½ %
" " ....Nos. 19 @ 26, dis 60 @ 62½ %
" " ....Nos. 27 @ 36, dis 62½ @ 65 %
Coppered.........Nos. 0 @ 18, dis 52½ @ 55 %
Galvanized, Nos. 0 to 6.........⅌ ℔ 10c, dis 30 @ 35 %
" Nos. 7 to 18.........market list, dis 30 @ 35 %
Tinned, Nos. 0 to 18.........dis 35 @ 40 %
Cast Steel.........dis 20 @ 25 %
Tinned Broom Wire, Nos. 18 to 25.........dis 42½ @ 45 %
Galvanized Telegraph, Nos. 7 to 9.........⅌ ℔ 9c
" " Nos. 10 and 11.........⅌ ℔ 10c
" " No. 12.........⅌ ℔ 10½c
Annealed Fence, Nos. 8 and 9.........dis 57½ @ 60 %
" Grape, Nos. 10 to 14.........dis 57½ %
Fence Staples.........⅌ ℔ 7 @ 7½c
Fence Staples, Galvanized.........⅌ ℔ 9½ @ 10c
Stubs Steel Wire.........$7.00 to $ gold
Japanned Barb Fence.........⅌ ℔ 15c
Galvanized " ....⅌ ℔ 18c
Steel Music Wire, Nos. 12 to 27.........⅌ ℔
Judd's Picture Wire.........dis 80&20 %
Clothes Line Wire, Galvanized.........⅌ coil 43 @ 50c, net

Wrenches.
American Adjustable.........dis 45 %
Baxter's Adjustable "S," New list May 1, '76.....dis 20 %

" Diagonal. " " ....dis 20 %
Collins & Co.'s.........dis 45 %
Coes Genuine.........dis 50&5 %
" Pattern (Wrought).........dis 50&10 %
" " (Malleable).........dis 75&10 %
Girard.........dis 50&10 %
Hull & Belden's "Climax".........dis 25 %
Knight's Patent.........dis 25 %
Lindsay's " ....dis 25 %
Taft's Pattern.........dis 75&10 %
Davis' Patent Duplex.........new list, dis 25 %
Bemis & Call's Patent Combination.........dis 20&5 %
" " Merrick's Pattern.........dis 25&2½ %
" " Briggs' Patent.........dis 20&5 %
Aiken Pocket (Bright).........$8.00, dis 40 %

Wringers. Per doz.
Universal, without Cog Wheels.........$54.00
" with Cog Wh'ls, No. 2½, small fam'y size 63.00
" " " No. 2, usual " .. 66.00
Crown No. 2.........54.00
" No. 2½.........60.00
" No. 66.00
Climax No. 2.........67.00
" No. 1½.........78.00
XXX Universal No. 2.........67.00
" " No. 1½.........78.00
Household, no Cog Wheels.........54.00
Sherman, with " 63.00
Eureka, no " 60.00
Reliance, with " 63.00
Novelty, No. 10, with Cog Wheels.........63.00
" No. 2, " " 66.00
" No. 22, " " 70.00
Excelsior, No. A, with Folding Bench.........84.00
" No. E, for Set Tubs.........72.00
Keystone No. 1, Wood Frame, no Gear.........50.00
" No. 2, Iron " 48.00
" No. 2½, Wood " Purchase Gear.........60.00
" No. 10, Wood " Common Gear.........57.00
Peerless, No. 2.........66.00
" No. 3.........74.00
New Climax, No. 2 Wood Frame, Purchase Gear.. 67.00
" " 3 " " " .. 70.00
" " 4 " " " .. 78.00

Stamped Tinware.
Common Stamped Ware.........dis 35 %
Stamped Deep and Retinned Ware.........dis 45 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ⅌ ℔; Sheet, Band Hoop and Scroll, 1½ to 1⅞c. ⅌ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ⅌ ton; Polished Sheet, 3c. ⅌ ℔; Wrought Scrap, $8 ⅌ ton; Cast Scrap, $6 per ton. Railroad, 70c. ⅌ 100 ℔s. Boiler and Plate, 1½c. ⅌ ℔.

Pig Iron—American.
Foundry No. 1.........⅌ ton $18.00 @ 19.00
" No. 2.........⅌ ton 17.00 @ 18.00
Gray Forge.........⅌ ton 16.00 @ 17.00

SCOTCH.
Glengarnock.........⅌ ton @ 25.00
Eglinton.........⅌ ton 23.50 @ 24.00
Coltness.........⅌ ton 26.00 @ 26.50

Rails.
Iron, at mill.........⅌ ton $33.00 @ 37.00
Steel, " ....nominal ⅌ ton 42.00 @ 45.00
Old Rails.........⅌ ton 18.00 @ 18.50

Scrap.
Wrought Scrap, from yard.........⅌ ton 22.00 @ 23.00

Bar Iron, from Store.
Common Iron:
¾ to 2 in. round and square......... } ⅌ ℔ 1.8 @ 1.9c
1 to 6 in. x ⅜ to 1 in......... }
Refined Iron:
¾ to 2 in. round and square......... } ⅌ ℔ 2 @ 2.1c
1 to 6 in. x ⅜ to 1 in......... }
1 to 6 in. x ¼ and 5-16.........⅌ ℔ 2.2 @ 2.3c
Rods—⅝ and 11-16 round and square.....⅌ ℔ 2.1 @ 2.2c
Bands—1 to 6x12 to 3-16.........⅌ ℔ 2.5 @ 2.6c
Swedish Iron:
Ordinary sizes.........5c

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20.........	⅌ ℔ 3 c	4
21 to 24.........	⅌ ℔ 3¼c	4 @ 4¼c
25 to 26.........	⅌ ℔ 3½c	4¼ @ 4½c
27.........	⅌ ℔ 3¾c	4¼ @ 4½c
28.........	⅌ ℔ 4 c	4¾c

Galvanized, 14 to 20, prime,	⅌ ℔ 7¼c;	2d qual,	⅌ ℔ 6 c
" 21 to 24,	"	⅌ ℔ 8 c;	"	⅌ ℔ 6½c
" 25 to 26,	"	⅌ ℔ 8½c;	"	⅌ ℔ 7 c
" 27	"	⅌ ℔ 9 c;	"	⅌ ℔ 7½c
" 28	"	⅌ ℔ 9½c;	"	⅌ ℔ 8 c

Patent Planished.........⅌ ℔ A, 11c; B, 9½c
Russia, Nos. 8 to 16.........⅌ ℔ 11½ @ 12c
American Cold Rolled.........⅌ ℔ 4½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper, 4c ⅌ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.
American Ingot.........⅌ ℔ 19 @ 19¼c
English " ....⅌ ℔

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.
Braziers' Copper, ordinary sizes, over 16 oz., ⅌ sq. ft.........⅌ ℔ 30c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ⅌ sq. ft.........⅌ ℔ 32c
Braziers' Copper, 12 oz., ⅌ sq. ft.........⅌ ℔ 34c
Circles less than 84 in. in diameter.........⅌ ℔ 33c
Circles 84 in. diameter and over.........⅌ ℔ 36c
Segment and Pattern Sheets.........⅌ ℔ 33c
Locomotive Fire Box Sheets.........⅌ ℔ 30c
Sheathing Copper, over 12 oz. ⅌ sq. ft.........⅌ ℔ 28c
Bolt Copper.........⅌ ℔ 30c
Copper Bottoms.........⅌ ℔ 30c net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the sq. ft.

TINNING.
14x48, by the case.........⅌ sheet 6c
14x48, less than case.........⅌ sheet 8c
For tinning both sides, double the above amount.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier..⅌ ℔ 36c By the case. ⅌ ℔ 35c
12 oz. and lighter.........⅌ ℔ 39c " " ..⅌ ℔ 38c
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ⅌ ℔ 38c By the case. ⅌ ℔ 37c
(And all sizes not over 20 in. wide.)
30x60.
14 and 16 oz. and heavier.........⅌ ℔ 40c
12 oz.........⅌ ℔ 43c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.
BRASS MANUFACTURERS' PRICE LIST.
January 1, 1877.
Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ⅌ ℔.

HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in.........30c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive.........34c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive.........37c
½c. ⅌ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at...50c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in..37c
Printers' Rules.........44c
Sheets wider than 30 in. and under 40 in.........45c
" " 40 in. and over.........47c
Circular Sheets, in diam. from 4 in. to 14, inclusive..41c
" " " over 14 " 20, " ..45c
" " " " 20 " 30, " ..48c
" " " " 30 " 40, " ..51c
" " " " 40 in.........54c

LOW BRASS.
4c ⅌ ℔ more than High Brass,
Gilding Metal, 8c ⅌ ℔ more than High Brass.
Platers' or Gold Metal { In Bars.........46c / Sawed.........49c / Planed or Polished.........52c }

FOR SLITTING.
Metal in width 2 in. to ½ in. to No. 28, inclusive, 1c. ⅌ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ⅌ ℔ advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c ⅌ ℔ advance.
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. ⅌ ℔ advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. ⅌ ℔ advance.
Metal, ¼ in. in width and less, 10c. ⅌ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ⅌ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
per cent., 12 ℔., to No. 26.........	$0.60	$0.85
6 " " "	.68	.95
10 " " "	.84	1.15
15 " " "	1.04	1.40
18 " " "	1.15	1.55

German Silver Sheets over 12 in. wide and weighing more than 16 ℔s., $2.25 ⅌ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ⅌ ℔ on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers, at 50c ⅌ ℔ additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20.........	$0.34	$0.38	$0.45
No. 21.........	.35	.39	.46
No. 22.........	.36	.40	.47
No. 23.........	.37	.41	.48
No. 24.........	.39	.43	.50
No. 25.........	.42	.46	.53
No. 26.........	.44	.48	.55
No. 27.........	.46	.50	.57
No. 28.........	.49	.53	.60
No. 29.........	.52	.56	.63
No. 30.........	.55	.59	.69
No. 31.........	.59	.63	.75
No. 32.........	.63	.67	.81
No. 33.........	.67	.71	.90
No. 34.........	.71	.75	1.00

Spring Wire 2c ⅌ ℔ advance.
Flat, Square and Half Round Wire 5c ⅌ ℔ advance on Round Wire.
Fancy Wire not less than 10c ⅌ ℔ advance of Round Wire.
Brass Rods, No. 8 and smaller not less than 2 feet lengths, 45c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 40c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.
Common Plain Brass Pail Ears.........$0.41
Brass Door Rail.........45

SCRAP.
High Brass Scrap.........16c
Low " 18c
Gilding.........20c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING. ⅌ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in.........$0.40
" above 3 in.........50
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch.........78
" 3-16 " 1.10
" ⅛ " 1.60
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20.........
English, Scotch and Extra Patterns Fancy Tubing to No. 20.........53
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.
Plain.........28
Fancy.........31
Scotch and Extra Patterns.........34

GERMAN SILVER TUBING.
4 Per cent.........85
6 " 95
9 " 1.10
12 " 1.25
15 " 1.40
16 " 1.45
18 " 1.55
20 " 1.60

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ⅌ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ⅌ ℔; over 11, 3½ cents ⅌ ℔, and 10 % ad val. Railway Bars, 1¼ cents ⅌ ℔. Railway Bars, in part Steel, 1 cent ⅌ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool.........15c
Spring.........7c
Homogeneous.........12½c
Boiler Plate.........8c
Tire.........5½c
Machinery (round and square).........9c
File.........9c
Sheet.........11 @ 16c
Saw Plate, mill and mulay.........14 @ 16½c
" gang and X cut.........13 @ 14c
" circular as to size.........18 @ 30c

Chrome Steel.
Tool.........⅌ ℔ 14 @ 15c
Tool, extra fine.........⅌ ℔ 40 @ 75c
Spring.........⅌ ℔ 8 @ 9c
Machinery.........⅌ ℔ 8 @ 10c
Gun or Homogeneous.........⅌ ℔ 12 @ 16c

English Steel.—Payable in gold, net.
" Best Cast.........⅌ ℔ 17¾c
" Extra Cast.........⅌ ℔ 18¾c
" Round Machinery, Cast......⅌ ℔ 10¼ @ 11½c
" Swaged, Cast.........⅌ ℔ 19½c
" Best Double Shear.........⅌ ℔ 17¾c
" Blister, 1st quality.........⅌ ℔ 14½c
" " 2d quality.........⅌ ℔ 13c
German Steel, Best.........⅌ ℔ 11½c
" 2d quality.........⅌ ℔ 10½c
" 3d quality.........⅌ ℔ 9½c
Sheet Cast Steel, 1st quality.........⅌ ℔ 17¾c
" " 2d quality.........⅌ ℔ 14½c
" " 3d quality.........⅌ ℔ 12½c
File Steel, Flat and ½ Round.........⅌ ℔ 12½c
" Square and Round.........⅌ ℔ 12½c
" Mill.........⅌ ℔ 13½c
" Taper to 4 inch.........⅌ ℔ 16c
" Taper 3 and 3½ inch.........⅌ ℔ 18c

ANTIMONY.........13½c

LEAD.—Duty: Pig $2 ⅌ 100 ℔s; old Lead, 1½c ⅌ ℔ Pipe and Sheet, 2¾c ⅌ ℔.
Spanish.........6⅝ @ 6¾c gold
German Refined.........6¾c gold
English.........6¾ @ 7c gold
American.........5¼ @ 5½c
Bar.........7c, dis 10 %
Pipe.........7½c, dis 10 %
Tin Lined Pipe.........15c, dis 10 %
Sheet.........8c, dis 10 %
Shot.........Drop 8¾; Buck, 9¾c, dis 10 %

BABBITT METAL.
N. P. U.........⅌ ℔ 8½ @ 9c
A 25c; B, 20c; C, 15c; D, 12c ⅌ ℔.

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ⅌ ℔; Electro-galvanized Plates, 2c ⅌ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.
Banca.........⅌ ℔ 19 @ 19½ currency
Straits.........⅌ ℔ 17 @ 17½ currency
English.........⅌ ℔ 17½ currency

TIN PLATES, CURRENCY PRICES
I C 10x14 / 12x12 / 14x20 } Prime Charcoal.........$7.00 @ 7.25
I X 10x14 / 12x12 / 14x20 } Prime Charcoal.........9.25 @ 9.50
D C 12½x17 " 6.75
D X 12½x17 " 9.00
For each additional X add.........2.25

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14 / I C 12x12 / I C 14x20	$6.75	6.50	6.00 @ 6.25

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20....	@ $6.50	6.00 @ 6.37½	5.75 @ 6.25
I X 14x20....	@ 8.75	....	....
I C 20x28....	@ 14.00	13.00 @ 13.50	12.00 @ 13.00
I X 20x28....	@ 18.50	....	....
I C 20x200....	@ 19.50	....	....

I C 14x20 M. F. Brand.........$7.25 @ 7.37½
SOLDER.........No. 1, 10½ @ 11½c; No. 2, 9¾ @ 10½c
SPELTER—Duty: In Pigs, Bars and Plates, $1 ⅌ 100 ℔s.
Silesian, cash.........6¾ @ 7c gold
American, cash.........6½ @ 6¾c
Lehigh, on spot.........10c
ZINC.—Duty: Pig or Block, $1.50 ⅌ 100 ℔s. Sheet, 2¼c ⅌ ℔.
Sheet, Cask.........7¾ @ 8c
" Open.........8c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)
Canvas linen.........5¾ @
" cotton, No. 1......... @ 6½
" " No. 2......... @ 3½
White linen rags, No. 1.........5¼ @
" " No. 2.........3¼ @
Colored.........2¼ @
Mixed woolens.........2½ @ 3¼
Soft woolens.........7 @
Gunny bagging.........3½ @
Jute Butts.........3 @ 3½
Kentucky bagging.........5 @
Waste paper and scraps.........1 @ 1½
Rope cuttings.........1½ @ 3
Kentucky bale rope.........4 @ 4½
Oakum junk, No. 1.........5½ @ 5¾
" No. 2......... @ 4
Grass rope.........3½ @
Tarred shaking.........2 @
White collar cuttings, all paper.........7 @
" " " muslin lined.........5 @
" " Envelope.........7 @
Hard White Shavings, No. 1.........5½ @
Soft " " No. 1.........4½ @ 4¾
White Shavings, No. 2.........4½ @ 4¾
Mixed Shavings, part white.........3½ @ 4
Imperfections, No. 2, best folded sheets.........4½ @
" No. 1, Heavy Stock.........4¼ @
Book Stock.........3½ @ 3¾
" " Mixed.........4½ @
" " No. 2, light.........2 @
Newspaper Stock.........2¾ @
Prints.........1½ @ 2
Pure Manilas.........2¾ @ 2½
Bogus Manilas and Hardwares.........1 @
Commons.........½ @
Binders' Board Cuttings.........1 @
Straw Board Cuttings.........¾ @
Woolen Tailor Clips.........13 @ 14
Satinet " ....2 @ 2½

Old Metal.
Copper.........15 @ 16
Yellow Metal.........13 @
Brass, light.........9 @
" heavy.........10½ @
Heavy Composition.........13 @
Old Lead, solid......... @ 4¼
Tea Lead......... @ 3½
Zinc......... @ 4½
Pewter, No. 1.........13 @ 9
" No. 2.........8 @ 6½
Spelter......... @
Wrought Iron.........per ton $19.00
Machinery Iron.........per ton 13.00
Light Iron.........per ton 13.00
Stove Plate.........per ton 10.50
Grate Bars.........per ton 7.00

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters.........⅌ ℔ 200
" " Ordinary.........6c
" Ivory Drop, fair.........12 @ 150
" " best.........230
Black Paint, in oil.........kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best.........40 @ 160
" " " " in oil.........35 @ 150
Blue, Chinese dry.........85c
" Ultramarine.........18 @ 30c
Brown, Spanish.........1¼c
" Van Dyke.........15c
Carmine, 40.........combination price
Green, Chrome.........15 @ 23c
" " in oil.........14 @ 18 @ 25c
" Paris.........good, 25c; best, 30c
" " in oil......... " 30c; " 45c
Mineral Paints.........1¼ @ 4c
Orange Mineral.........14c
Red Lead, American.........8c
" " English.........9½c gold
" Venetian (N. C.) dry.........$1.70 @ $1.75
" " in oil.........asst'd cans, 11c; kegs, 8c
" Indian dry.........12c
Rose Pink.........10 @ 13c
Sienna, American, Raw.........4c
" Burnt.........4½c
" " in oil.........10 @ 16 @ 20c
" Raw " ....11 @ 15 @ 25c
Umber, Burnt.........4 @ 8c
" " in oil.........9 @ 12 @ 16c
" Raw.........3½ @ 7½c
" " in oil.........10 @ 16 @ 18c
Vermillion, Chinese.........80c, gold
" English.........60c, gold
" Trieste.........1.10, gold
" American, Common.........18c
White Lead, American, pure dry.........8½c
" " " " in oil.........9c
White, Paris, English, prime.........in bbls. 2 @ 2½c
Yellow Ochre, French.........$1.75
" " " in oil...asst'd cans, 11c; kegs, 8c
" " Vermont.........in casks 1½c
Yellow Chrome.........17 @ 27c
" " in oil.........14 @ 18 @ 25c
Zinc White, American No. 1, dry.........6 @ 9c
" " No. 1, in oil.........11
" French (Paris).........11
" " in oil.........10½ @ 11½

Oils.
Linseed, Raw, in casks and bbls.........⅌ gal. 59c @ 60c
" Boiled, " " .... " 64c @ 65c
Whale, Crude.........bbl. 62c @ 65c
" Bleached Winter.........bbl, 70c
" Unbleached.........bbl, 67c
Sperm, Crude.........bbl, 1.15 @ 1.20
" Winter unbleached.........bbl, 1.50
" " bleached.........bbl, 1.55
Seal, Extra Refined.........bbl, —
Lard, Pure Winter.........bbl, 80c
" Spring.........bbl, 80c
Cotton Seed, Crude.........bbl, 55c
" Southern Yellow.........bbl, 67c
" White.........bbl, —
Neatsfoot, Winter.........70c @ $1.10
Natural Lubricating.........38c @ 40c

Sundries.
Asphaltum.........9c
Benzine.........⅌ gal. 16c
Chalk.........¾c
" Block.........¾c
Dryer, Patent, Am'n.........ass't cans, 10½c; keg, 9c
" " English......... " 11c; " 9c
Flocks.........
Frostings.........50c
Glue, White.........33 @ 44c
" Sheet.........20c
Glaziers' Points, Zinc.........8c
Gum, Copal.........36c
" Damar.........25c
" Shellac, English.........41c
" " " dark.........40c
Litharge, English.........9c gold
Pumice Stone, selected Lumps.........4 @ 6c
" powdered.........2¾c
Putty, in bladders.........2c
" in bulk.........2¼c
Rotten Stone, soft, English.........8c
Spirits Turpentine.........37c
Whiting, Spanish.........¾c

Glass.
FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

Single Thick.—discount 60 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.........	$ 7.50	$ 6.75	$ 6.25	$ 5.75
11 x 14 to 16 x 24.........	8.50	7.75	7.25	6.50
18 x 22 to 20 x 30.........	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30.........	12.25	10.75	9.00	
26 x 28 to 24 x 36.........	13.00	11.50	9.75	
26 x 37 to 26 x 44.........	14.50	13.25	10.75	
26 x 40 to 30 x 50.........	15.00	14.00	11.25	
30 x 52 to 30 x 54.........	16.00	14.50	12.00	
30 x 56 to 34 x 56.........	17.25	15.50	13.50	
34 x 58 to 34 x 60.........	18.25	17.25	15.00	
36 x 60 to 40 x 60.........	20.75	18.75	17.75	

Double Thick.—Discount 60&10 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.........	$12.00	$11.00	$10.00	$ 9.25
11 x 14 to 16 x 24.........	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30.........	17.25	15.75	14.00	
15 x 36 to 24 x 30.........	19.75	17.25	14.50	
26 x 28 to 24 x 36.........	21.00	18.50	15.75	
26 x 36 to 26 x 44.........	23.25	21.25	17.25	
26 x 46 to 30 x 50.........	24.00	22.50	18.00	
30 x 52 to 30 x 54.........	25.75	23.25	19.25	
30 x 56 to 34 x 56.........	27.75	25.00	21.75	
34 x 58 to 34 x 60.........	29.25	27.75	24.00	
36 x 60 to 40 x 60.........	33.25	30.00	27.75	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

PRATT & CO.,

BUFFALO, N. Y.,

MANUFACTURERS AND DEALERS IN

Hardware, Iron & Nails,

Bolts, Nuts, Washers, Screws, &c.

TRADE SPECIALTIES.

Globe Horse Nails, Putnam Horse Nails, National Horse Nails, Buffalo Forged Horse Nails.

Burden Horse Shoes, Walker Horse Shoes, Providence Horse Shoes.

TOE CALKS, CAST STEEL, BELLOWS, ANVILS AND VISES.

FRANCIS' AXES, full Assortment.

Special Brands.—"KING OF THE FOREST," "ROYAL WOOD CHOPPER."

Tubular Lanterns, Fletcher Post Auger, Coil and Log Chains.

WROUGHT IRON WORK to order.

Orders promptly attended.

G. B. WALBRIDGE & CO.,

83 Reade Street, New York.

100
COCK'S
BEST STRONG
Anti-Corrosive
PERCUSSION CAPS,
Warranted
WATERPROOF
No. 12
Quality 1 F. L.

(GREEN LABEL.)

To Reduce a Large Stock, we offer Special Inducements to the Trade.

PRICE, IN CASES OF 100 M EACH (ASSORTED NUMBERS), 50c. PER M.

Discount According to Quantity.

Patent Palace Coal Vases.

Three Patterns. Fifteen Designs.

Dealers will find them very popular and salable.

SOLE MANUFACTURERS,

SIDNEY SHEPARD & CO., Buffalo, N. Y.

Please send for Illustrated Circular and Price List.

THE STANLEY WORKS,

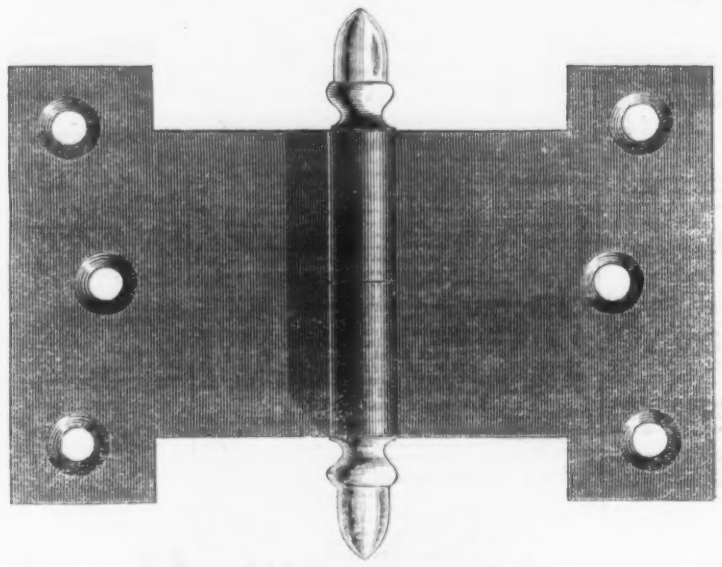
MANUFACTURERS OF

Strap and T Hinges, Wrought Iron Butts, Flush Bolts and other Door Bolts, Washers, Etc.

FACTORIES, New Britain, Conn. WAREHOUSE, 79 Chambers St., New York,

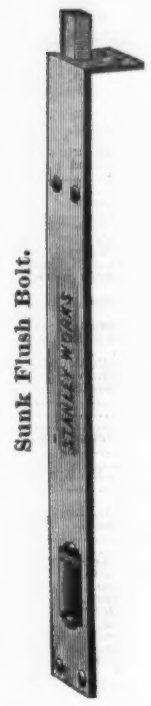
New York City Sunk Flush Bolt.

Bronzed and Plated Butts.
Wrot. Japanned Butts, with Acorns.
Wrot. Narrow and Broad Butts.
Wrot. Reversible and Loose Joint.
Wrot. Table Hinges and Back Flaps
Wrot. Light Narrow Butts.
Wrot. Light Inside Blind Butts.
Wrot. Parliament Butts.
Japanned Screws.

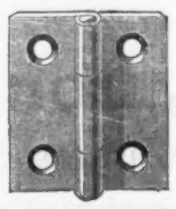


Wrought Iron Parliament Butt.

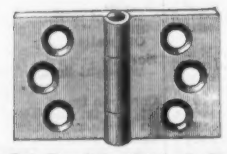
Bronzed and Plated Bolts.
Wrot. Flush Bolts.
Wrot. Barrel Bolts.
Wrot. Square Bolts.
Wrot. Shutter Bolts.
Wrot. Tower and Neck Bolts.
Canada Bolts,
Wrot. Hasps and Staples,
Wrot. Chest Handles, Etc., Etc.



Sunk Flush Bolt.



Light Narrow Butt.



Light Inside Blind Butt.

Hasp and Staple with Double Hook.

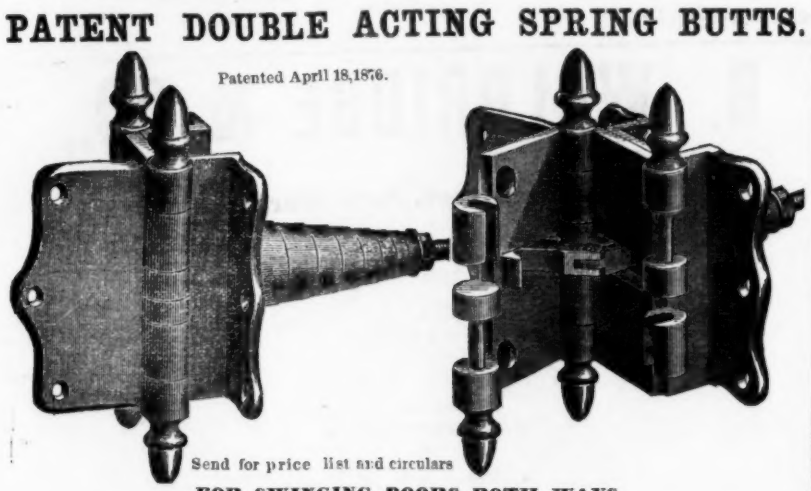
Double Swivel Hasp.

Hinge Hasp.

Above Goods furnished Plain, Galvanized, Tinned, Japanned, Bronzed, Silver and Nickel-Plated. We have a complete assortment on hand and can fill orders promptly.

PATENT DOUBLE ACTING SPRING BUTTS.

Patented April 18,1876.



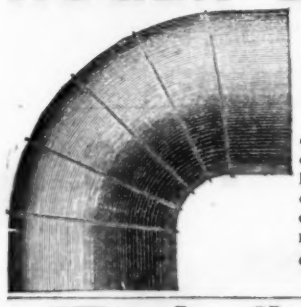
Send for price list and circulars

FOR SWINGING DOORS BOTH WAYS.

These Butts are the first ever constructed with two leaves only, and with flanges attached thereto for fastening to the door and casing, thus rendering them much more substantial and easy to put on, as the screws are all driven from the outside. By means of the flanges the door is hung firmly to the casing, instead of to a strip *as is the case with all other double acting Butts*, and the screws do not become loose, as the strain on them is much less. On the back of the Butt is a powerful volute spring, and draws in *direct line* with the center of the door, thus holding the door firmly in position, and *obviating all sag*. Our price list is from 25 to 40 per cent. lower than others. Manufactured by **THE SABIN MFG. CO., Montpelier, Vt.**

HOGEN ELBOW COMP'Y,

MANUFACTURERS OF PATENT STAMPED



Stove Pipe Elbows.

The Hogen Elbow has no CRIMPS, CAVITIES or ANGLES, which cause accumulations that rust or corrode the iron; it is also easily polished and kept clean, its surface being smooth and regular on all sides. The Hogen Elbow forms the arc of a circle, and invariably holds the pipe securely at right angles, without the use of rivets.

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OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

(Double and Single Gate, ½ in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

TACKS

of all sizes, Made of Iron, Steel, Zinc, and Copper, of any Size or Shape.

Manufactured by

BRIGHAM, LITCHFIELD & VINING, South Abington, Mass.

WEEK'S
Reversible Sad & Polishing Iron.

Patented Nov. 19, 1872.

This is an Iron made to revolve in a handle, having two flat surfaces; both surfaces are *polished very smoothly*. One surface presents the same face that an ordinary Smoothing Iron has, and is intended to be used as such; the other has the heel ground off in the same manner that the best Polishing Iron has, and is intended to be used as a Polishing Iron.

Both surfaces are heavily nickel-plated, and with the polishing face a most *beautiful French gloss* can be produced with but a very little labor.

A. A. WEEKS, Sole Manufacturer,
No. 82 John Street, New York.

D. W. HAZLETON & CO

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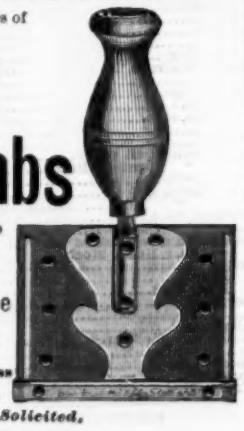
Manufacturers of

Curry Combs



Galvanized Square and Ornamental

Conductor Pipe

RIBBED TUBING

Stamped & Press Work to order.

Correspondence Solicited.

DUPLEX Curry Comb

We call the attention of Hardware Dealers to our Double Curry Comb, comprising a fine and coarse side: or virtually two combs in one. It is useful, durable and novel, and needs no argument to convince any one of its practicability. It sells on sight, and is bound to supersede all other combs. We want one reliable dealer in each State or large city to handle it. Correspondence solicited. Address

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THE CONNECTICUT VALLEY MFG. CO.,

CENTERBROOK, CONN., Manufacturers of

Lewis' Patent Single Twist Spur Bits,

GERMAN GIMLET BITS, etc.

TRADE MARK

Send for our illustrated price list and discounts.

JOB T. PUGH'S Celebrated AUGERS and BITS.

WARRANTED SUPERIOR TO ANY OTHER MAKE.

They are made entirely by hand, and are especially adapted to hard wood. Supplied to the trade only. Gas Fitters', Millwrights', and Carpenters' Augers and Bits. Machine Bits of all descriptions made at short notice.

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The Hubbel Screw Co.,

LIMITED,

Are now prepared to sell, to approved parties, licenses to use the improvements in machinery for making Metal Screws, secured to them by Letters Patent, at the rate of fifteen dollars per month.

They are also prepared to contract for Machine Screws of every description made in solid dies.

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LANSDELL & LENG'S
Patent Lever and Cam Valves.
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Steam Siphon Pumps.
IRON
Of every description, for domestic use and export.

HARKINS & PRAY,

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The Ball Tuyere Iron
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TIRE BENDERS.

FINE GRAY IRON CASTINGS of all kinds made to order.

SCOTT'S Standard Bellows

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TIN PLATE.

We have the LARGEST Square Sheet of Tin Plate ever made, 144 inches long by 48 inches wid

ALSO,

The SMALLEST Sheet of Tin Plate ever made, 6 inches wide by 10 inches long.

Between these extreme sizes we have open for inspection our immense stock of odd and regular sizes of Tin Plates of all grades, qualities and thicknesses, ranging from number 38 to numbes 12 gauges.

In addition to the above—and our assortment of special Patterns, Splayed Boiler Sheets, Milk Pan Tin, Stove Door Lining Plates, etc.—we always carry in large stock,

CIRCLES of Every Description,

From 6 Inches to 40 Inches, IC to 8X Thickness, No. 30 to No. 20 Gauge, 3 Ounces to 30 Pounds Weight.

These are all stamped out, by correct dies, from the very finest quality of Charcoal Plates, and afterward tinned.
Send for our illustrated catalogue, descriptive circulars and price lists.

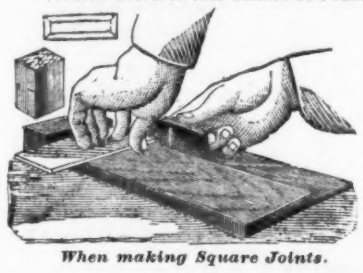
When desiring any information on Tin Plate, it will be to your advantage to write us.

N. & G. TAYLOR CO., Philadelphia.

SHIPMAN'S PAT. SHUTEING BOARD,

With AMATEUR PLANE.

A More Useful Article Cannot be Found. Every Hardware Dealer Should Have Them.



When making Square Joints.

When making 6 and 8 Sq. Bottoms.

Amateur Plane.

When Making Octagon Tops.

When beveling for 6 and 8 Square.

The above cuts represent the BOARD, with its Attachments, placed in position for doing the different kinds of work, all put up in a neat box, and sent to any address for the prices given below.

Plain, with Board made of Whitewood, **75c.** By mail, 25c. extra. Plain, with Board made of Black Walnut, **$1.** By mail, 25c. extra.

This is not only essential for all Amateurs, but is indispensable to every Carpenter, Cabinet Maker, Pattern Maker, and, in fact, Wood Workers of every description. Fret Sawers and Lovers of Fancy Work cannot do without it.

Manufactured only by

SHIPMAN & BINDER,
Of ROCHESTER, N, Y.

Manufacturers of the celebrated

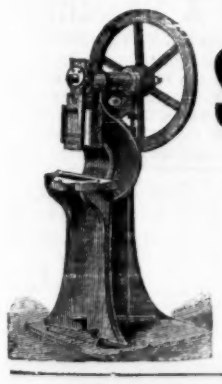
CENTENNIAL BRACKET SAW,

Now acknowledged to be the leading Saw of the country.

PRESSES, DROP HAMMERS, DIES,

And Other Tools

FOR THE MANUFACTURE OF ALL KINDS OF



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"Boss" Funnel Coal Hod.

Heinz, Pierce & Munschauer,

BUFFALO, N. Y., Manufacturers.

The "Boss" is the most perfect Funnel Hod in the market. It is so constructed that the mouth of the Hod cannot become filled in discharging. The styles, sizes and prices are as follows:

	Jap'nd.	Bronze Band.	Decorated.	Galvanized.
15 inches, per doz..	$4.35	$5.00	$5.50	$6.50
16 " " ..	5.00	5.75	6.25	7.25
17 " " ..	5.65	6.50	7.00	8.25
18 " " ..	6.25	7.25	7.75	9.25

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Special discounts made for quantities on application.

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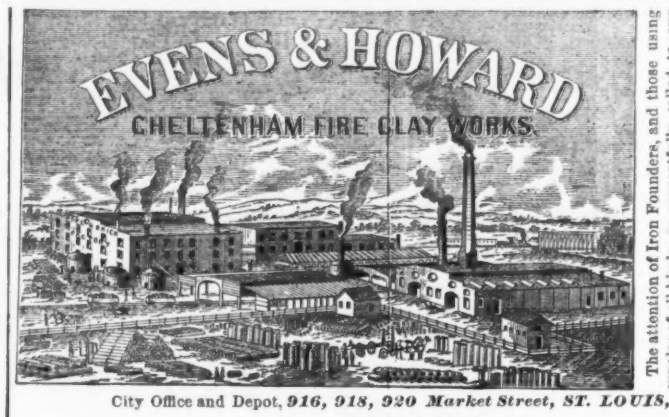

The attention of Iron Founders, and those using cupolas of all kinds, is respectfully called to our **SILICA BLOCKS** for cupola linings, which are superior to any heretofore used for this purpose. We also furnish Dry Milled Kiln-Dried and Bolted Fire Clay. Ground Fire Brick and Fire Sand to be used as mortar in laying same, the use of which will make a substantial and durable lining.

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Dry Milled Fire Clay, Fire Sand, Ground Fire Brick in barrels and bulk, Fire Clay Sewer Pipe, Heat Pipe, Chimney Tops, Flue Linings, Drain Tile, &c.

Established in 1854.

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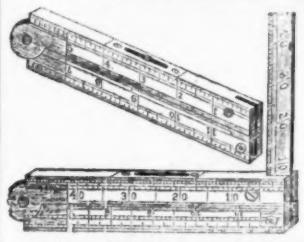

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L. C. Stephen's Patent Combination Rule.

Rule graduated in foreign measure to order.

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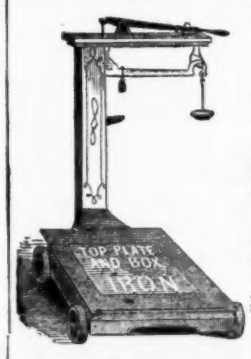

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Scales and Testing Machines.

Self-Adjusting Railroad Track Scales; Coal, Hay and Cattle Scales; Patented FURNACE CHARGING SCALES; Warehouse and Platform Scales; Testing Machines of any capacity.

Send for illustrated price list, mailed free. Tests made daily. Reports copied and kept confidential. Special attention devoted to repair work. Skillful Mechanics sent to all parts of the country. All work guaranteed.

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Cast Butts, Wrought Butts,
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Pulleys, Casters,
Knobs, Wagon Boxes,
Thimble Skeins, Piano Stools,
Knox and Universal Fluting Machines, Etc., Etc., Etc.

And Jobbers of GENERAL HARDWARE.

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G. W. Bradley's Edge Tools.

Butchers' Cleavers,
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Axes and Hatchets,
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MARTIN DOSCHER Agent, 96 Chambers Street N. Y.

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New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,

Established 1845.

Office, foot of Houston Street, East Rever,
NEW YORK.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

NEWTON & CO.,

Successors to

PALMER, NEWTON & CO.,

ALBANY, N. Y., Manufacturers

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c,

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.

FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay Retort Works,

Manufacturer of **FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS.**

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot: **418 to 422 East 23d St., N. Y**

TROY FIRE BRICK WORKS,

Troy, N. Y.,

JAMES OSTRANDER & SON,

ESTABLISHED 1848,

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Furnace Blocks, etc. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Cumberland Fire Brick Works.

GARDNER, STUART & CO.,

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STANDARD SAVAGE FIRE BRICK.

OFFICE:

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WORKS:

One mile from Mt. Savage Junction, Md., B. & O. R. R.

Illustrated Circulars and Price Lists on application.

Brooklyn Clay Retort

AND

FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Tile, Cupola Brick, &c. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burt's Creek, New Jersey. Manufactory: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 88 Van Dyke St.

MANHATTAN FIRE BRICK

and Enameled Clay Retort Works.

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Office, **633 E. 15th St., N. Y.** Clay Retorts, Enameled for Gas Houses; Retorts for burning raw bone and re-burning bone for Bone Black. Fire Bricks, Fire Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay Beds at Perth Amboy, N. J.

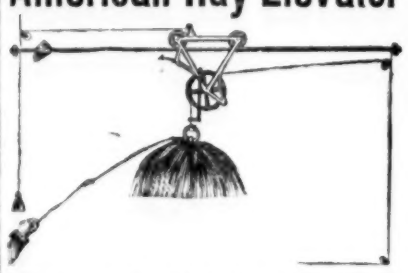
A. HALL & SONS, Perth Amboy, N. J.
ESTABLISHED 1846.

HALL & SONS, Buffalo, N. Y.
ESTABLISHED 1866.

FIRE BRICK

of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, Architectural Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick and Diamantine Building Brick.

American Hay Elevator



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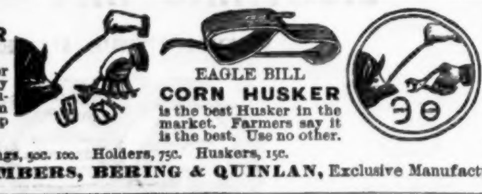

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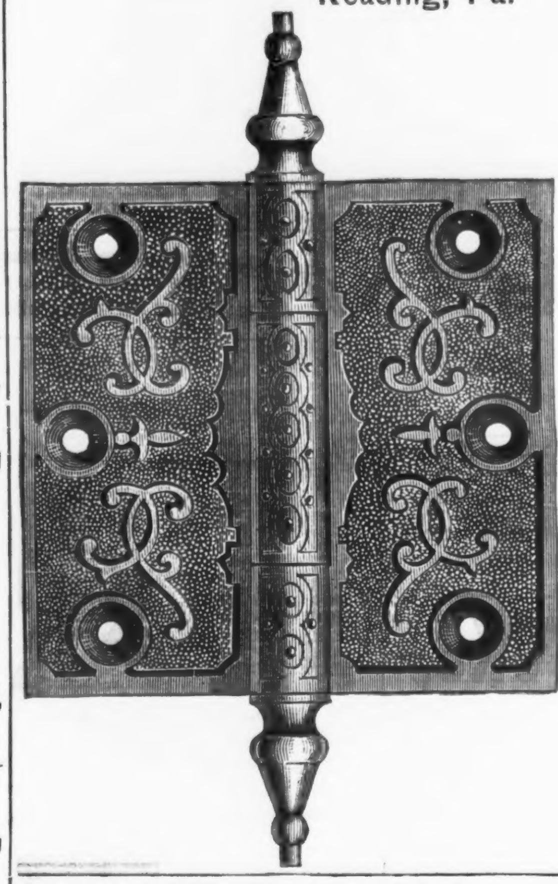

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J. DIFENBACH, of Germany, DAVID McHARDY, of Scotland, D. STEINMETZ, of Phila. } JUDGES.
A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
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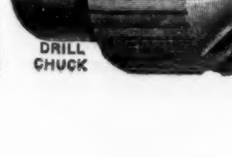

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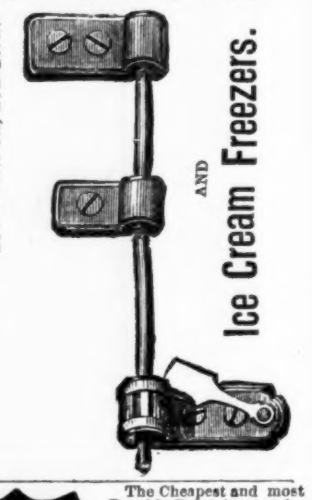

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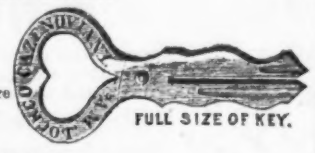

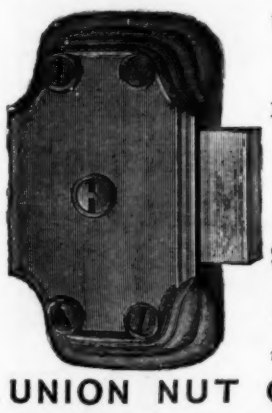

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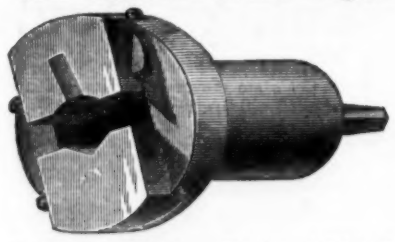
The internal arrangement of these Braces has been so changed as to avoid any *foundation* for a claim of infringement. Manufactured under our own patents, they are strong, simple, and cannot get out of order. We guarantee the goods and those who buy them. Numbers same as in our Catalogue.

Ives' Expansive Hollow Augers.

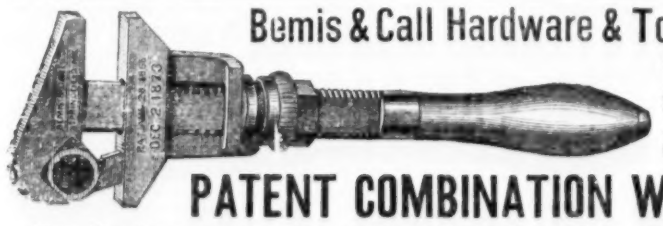


Made from Malleable Iron. This Auger is light and comely. It cuts any size, from ⅜ to 1½. No other milar tool has so great a range or works as well.

Ives' Novelty Hollow Augers.

Combine all the desirable qualities of both the Common Old and New Patterns, and are much superior to either, or any other ever made.

Bemis & Call Hardware & Tool Co.



This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but so all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield, Mass.

METALLIC SIEVES.

Protected by 14 patents.

MANN'S PATENT.

Best Sieve known, Cheap, Neat and Durable.

ADAMS & WESTLAKE MFG. CO.,

CHICAGO, ILLS.

GRANT & CO., Newark, N. J

Cap Rifles & Targets.

Established in 1839.

A. G. COES & CO.

WORCESTER, Mass., Manufacturers of THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

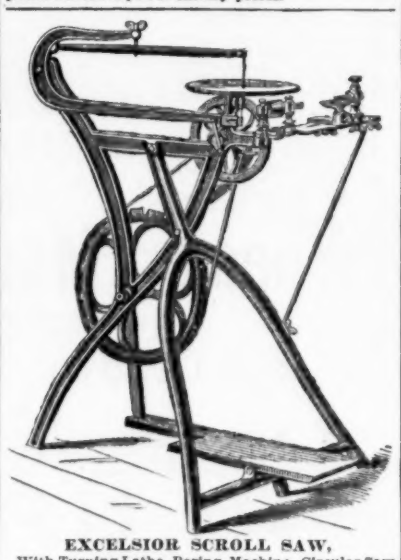
Which cannot be forced back into the handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.



EXCELSIOR SCROLL SAW,

With Turning Lathe, Boring Machine, Circular Saw and Tilting Table for Inlaying Work. The most complete amateur machine yet offered. The Scroll Saw Turning Lathe, Circular Saw or Boring Machine may be used at one time. The following is a partial description of the machine: Length of sweep, 19 in.; stroke, 2 in.; speed, 900 revolutions per minute; lathe bed, 16 and 22 in.; swing of lathe, 3 in.; revolution, about 6000 per minute. Price of Machine, with Scroll Saw, Inlaying Table, Boring Machine, $8.00; above with Lathe and Tools, $10.00. Send for circular giving description of Machine and list of Designs and Amateur Supplies.

EXCELSIOR SCROLL SAW CO., New Bedford, Mass.

LENNOX & PAINE

Manufacturers of

Iron, Brass & Steel Work.

Particular attention paid to **Model Making.**

Gear cutting for CLOCK WORKS, &c., a specialty.

55 Frankfort St., Cleveland, O.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Glass Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

George C. Grundy,

HARDWARE.

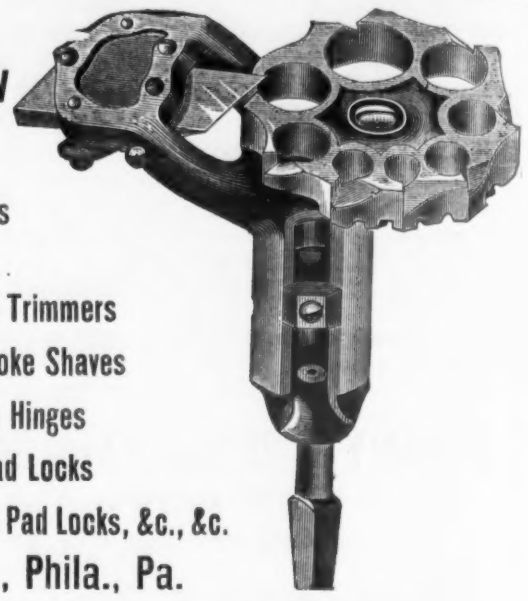
165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF



Bonney's Hollow AUGERS.

Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

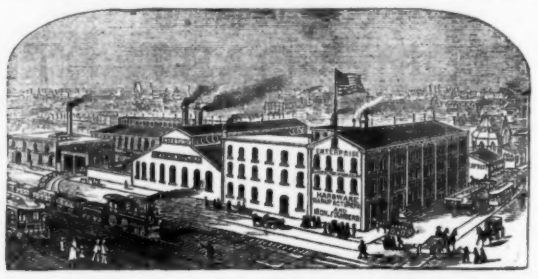
Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

ENTERPRISE MFG. CO., of Pa.

Patented Hardware Manufacturers and Iron Founders,

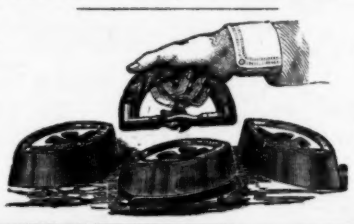
Third and Dauphin Streets, - - - Philadelphia.



SPECIALTIES:
American Coffee, Spice and Drug Mills.
Measuring Faucets.
Champion Tobacco Cutters, &c., &c.

SPECIALTIES:
Combined Sausage Stuffer, Fruit, Lard and Jelly Press.
Bung Hole Borers.
Self-Weighing Cheese Knives, &c., &c

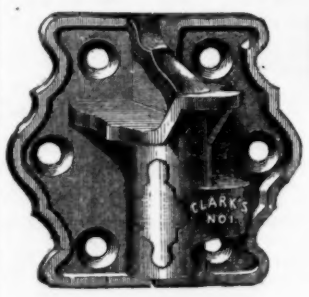
Enterprise Mfg. Co. Make the *Only Irons Filled with Non-Conducting* **FIRE CEMENT.** Send for circular and price list.



ENTERPRISE PATENT COLD HANDLE SMOOTHING AND POLISHING IRONS. Are made by Enterprise Mfg. Co. PHILADELPHIA, And sold by THE HARDWARE TRADE.

CLARK & CO.,

MANUFACTURERS OF



BUILDERS' HARDWARE.

426 & 428 Niagara Streets, BUFFALO, N. Y.

TENNIS & WILSON, Agents,

81 Beekman St., New York.

Send for Catalogue and Price List.

LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weights, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ₩ ℔, gold.....10½c
over 250 lbs.....11c. gold, net
Wilkinson's, ₩ ℔, gold.....11c. net
Eagle (American).....9 cents per lb—dis 20%

Apple Parers.—
Reading No. 75.....per doz $ 5 50 net
" " 76....." 6 25 net
" " 76....." 7 00 net
" " 77....." 7 50 net
Peach Parers....." 10 00 net
Little Favorite, corer and slicer....." 7 50 net
Lots of 10 to 25 dozen special price.

Axes.—
Mann's Red Warrior.....Per doz. $8 50 @ 9 00 net
Red Indian....." 8 50 @ 9 00 net
Red Chieftain, bevelled....." 9 00 @ 10 00 net
Crown Prince....." 9 50 @ 10 50 net

Augers and Auger Bits.—
Bates' Nut Augers.....dis 40&10 @ 50%
Cook's Augers.....dis 50 @ 50&5%
Watrous' Ship Augers.....dis 15%
Benjamin Pierce Auger Bitts.....dis 40%
Griswold Auger Bits.....dis 40&10 @ 50%
Cook's " " .....dis 50 @ 50&5%
Jennings' " " .....dis 10%
Bonney's Pat. Hol. Augers, list $48 ₩ doz...dis 25&10%
Stearns' Pat. Hol. Augers " $48 " ...dis 25&10%

Balances.—
Light and "Common".....dis 25&10%
All other Spring Balances.....dis 25%

Bells.—
Bevin Bros. Mfg Co. Light Hand Bells.....dis 70 @ 75%
Swiss Pattern Hand Bells.....dis 50 @ 5%&10%
Connell's Door Bells.....dis 50 @ 50&10%
Gt. Western & Kentucky Cow, new list.....dis 50%

Boring Machines.—
Upright, with augers, $5 00; without augers..$3 00 net
Angular, " 6 00; " 4 00 net

Bolts.—Eastern Carriage Bolts.....dis 75&37½—cash
Philadelphia " " .....dis 60&10 @ 60&20%
Stanley, Wrought Shutter.....dis 50&10 @ 60%

Braces.—Barber's.....dis 40&5%
Packus.....dis 50 @ 50&10%
Snofford.....dis 50%
American Ball.....dis 25&10%

Butts.—Cast Fast Joint, Narrow.....dis 50&10%
" " Broad.....dis 60&10%
Cast Loose Joint.....dis 65&10%
" Acorn, Loose Pin.....dis 65&10%
" Acorn " Jap'd.....dis 67½&10%
" Mayer's.....dis 65&10%
" Parliament.....dis 60&10%
Wrought Loose Pin.....dis 40&10%
" Table Hinges and Back Flaps.....dis 35&10%
" Narrow.....dis 40&10%
" Loose Joint.....dis 40&10%

Blind Butts.
Parker.....dis 60 @ 60&10%
Clark.....dis 60%
Shepard.....dis 60%
Lull & Porter.....dis 65 @ 65&10%
Huffer's.....dis 40%

Chains.—German Halter and Coll.....dis 30&5% gold
Galvanized Pump.....₩ ℔ 10½c net
Best Proof Coil Chain—(English).
¼ ⅜ ½ ⅝ ¾ ⅞ 1 gold
₩ ℔.....11½ 8½ 7½ 7½ 8½ 8½ 7c gold
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ in.

Chisels.—Socket Framing.....dis 65, 5&10%
Socket Firmer.....dis 65, 5&10%
Butcher's.....$5 00 to £ gold

Custers.—Bed.....dis 50&10%
Plate.....dis 50&10%

Coffee Mills.—Box and Side.....dis 25%
Enterprise.....dis 20%

Cutlery.—Walden Pocket.....dis 30 @ 35%
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net

Drawing Knives.—
Hart Mfg. Co.'s.....dis 65, 5&10%
Adjustable Handle.....dis 20%

Fry Pans.
Tinned.....dis 50&10 @ 60%
₩ doz..$3·50 4 00 4·50 5·00 5·50 6·50 7·50 9·00 10·00
No..... 0 1 2 3 4 5 6 7 8
Burnished.....dis 50&10 @ 60%
₩ doz..$3·00 3·25 4·25 4·75 5·25 6·00 7·00 8·00 9·00
No..... 0 1 2 3 4 5 6 7 8

Files.
Nicholson.....new list, dis 30%
Disston....." dis 30%
Butcher.....$4 50 @ $4 75 £ gold
Spencer.....4 50 @ 4 75 £ gold

Fluting Machines.
Imperial—4½ in. roll.....each $2 50 net
" —6 in. roll....." 3 00 net
Crown—4½ in. roll.....each 2 50 net
" —6 in. roll....." 3 00 net
" —8 in. roll....." 4 25 net
Eagle—3½ in. roll.....per doz. $18 00 net
" —5½ in. roll.....per doz. 24 00 net
Geneva Fluter.....per doz. 15 00 net
Favorite com. Fluter & Sad-iron..₩ doz $15 00 dis 15%

Hammers.
Yerkes & Plumb's.....dis 25 @ 30%
Hammond & Son's.....dis 25 @ 30%

Hatchets.
Yerkes & Plumb.....dis 25 @ 30%
Hammond.....dis 25 @ 30%
Hunt.....dis 25%

Hinges.
Strap and T.....dis 60 @ 60&5%

Horse Nails. Nos. 5 6 7 8 9 10
Ausable..... 30 27 25 24 23 22
" Pt'd & Polished.... 31 28 26 25 24 22
Globe..... 31 28 26 25 24 22
Clinton Horse Nails..... 20 18 17 16 15
" Polished and Pointed.....21 19 18 17 16
Southern, all sizes.....₩ ℔ 14c. net
Discount on Ausable & Globe, 20%; Clinton, 15%

Locks and Knobs.
Branford.....new list, dis 6%&10&2% cash
Gaylord Cabinet.....dis 25&2% cash
United States Lock Co.....dis 35%
American Padlocks.....dis 33⅓, 5&2% cash
Scandinavian Pad Locks.
₩ doz..$7·50 9·00 10·50 12·00 15·00 18·00 22·00 } 60&10
No..... 57 58 59 60 61 62 63 }
₩ doz.....$27·00 36·00 40·00 } 60
No..... 64 65 66 }

Lanterns.—
Square Candle and Oil.....₩ doz. $2 75 @ 3 00
Tubular.....No. 0, $10·50; No. 1, 12·50 ₩ doz. net
Guards, 50 cents extra per doz., net.

Mattocks.—
Long and Short Cutter.....₩ doz. $9 00 @ 9 50 net
Pennsylvania Pattern....." 9 50 @ 10 00 net

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20%
Stebbins' Gates.....dis 62½&10%
Lincoln's " .....dis 62½&10%
Landers, Frary & Clark's Petroleum.....dis 20&10%
Brass Liquor Cocks.....dis 50%
Cork Lined " .....dis 65 @ 65&10%

Meat Cutters.—Dixon's.....dis 25 @ 30%
Woodruff.....dis 25 @ 30%
Stowe.....dis 25 @ 30%
Hale's.....new list, dis 50&2%
American.....dis 25%
Stuffers.....dis 25 @ 30%
Enterprise Stuffers.....dis 20%

Planes.—Sandusky.....dis 40%
Ogontz.....dis 50&10%
Bailey.....dis 25&10%

Plane Irons.—Sandusky.....dis 10%
Butcher's.....gold £ $5 00

Plumbs and Levels.
Stanley's Adjustable.....dis 60&10%
" Non-Adjustable.....dis 60&10%

Picks.—Philadelphia.....dis 20%
Hunt's.....dis 25%

Rules—Stanley Boxwood.....dis 50&10%
Stanley Ivory.....dis 40&10%

Steelyards.—Hart's Pattern.....dis 60&10%
₩ doz.....$14·50 17·75 21·00 26·50 31·00 35·50
Lbs..... 50 100 150 200 250 300
American Pattern.....dis 25 @ 25&10%
₩ doz.....$5·50 7·00 9·00 10·00 11·00 12·00
Lbs..... 50 100 150 200 250 300
English Pattern.....dis 20 @ 25%
₩ doz.....$7·00 9·67 10·67 12·67 14·67 16·67
Lbs..... 50 100 150 200 250 300

Squares.—
Steel and Iron.....dis 50%; full case, dis 50&10%
Try Squares, Stanley.....dis 45&10%
Disston's Try Squares.....dis 45%

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $9·00 net
Clipper No. 10, Bronzed Blade Boxed and Sharpened.....₩ doz. $8·50 net
Clipper No. 5, Painted Red, Boxed and Sharpened.....₩ doz $8·25 net

Saws.—Disston's Hand, Panel and Rip.....dis 20%
Disston's Circular.....dis 30%
" Cross-Cut No. 2, Plain Tooth..₩ ft., 45c. net
" " Patent Tooth.....₩ ft., 45c. net
" " Champion Tooth.....₩ ft., 35c. net

Shovels and Spades.
Rowland.....dis 50&5%
Oliver Ames & Sons, new list.....dis 30%

Sad Irons.—4 to 10 lbs.....₩ ℔., 3¼ @ 3¾c
Mrs. Potts' Patent.....dis 30 @ 40%

Stone.—Arkansas Oil Stone.....₩ ℔ $1·35 net
Washita Extra....." 85c net
" No. 1....." 50c net
" " 2....." 25c net
" Slips....." 60c net
" Axe....." 25c net
Turkey Oil Stone No. 1....." 16½c net
" " " 2....." 16c net
" Axe Stone....." 25c net
Hindostan Oil Stone No. 1.....₩ ℔ 4 @ 4½c net
" Axe Stone....." 5 @ 5½c net

Screws.
United States and others in Combination....dis 60&10%

Spoons.—
Plated.....dis 40 @ 40&5%
German Silver.....dis 25%
Britannia, Boardmans.....dis 50&10%
" Parkers.....dis 50&10%
Tinned.....dis 50%
" by case.....dis 50%

Springs—Torrey.....₩ doz $2·00 @ 2·10 net
Philadelphia.....5 in., $5·00; 8 in., $7·00 ₩ doz. dis 25%
Chatfield.....No. 1, $3·50; 2, $4·00; 3, $6 00 ₩ doz. net
Gem Coil No. 1, Large Jap'd.....₩ doz $3·50 } dis
" " No. 2, Medium Jap'd....." 2·50 }
" " No. 3, Small " ....." 2·00 }

Stocks and Dies......dis 10&5%

Stove Polish.—Gem.....₩ gross, $4·25 @ 4·50 net
Dixon....." $5·75 @ 6·00 net
Onyx....." $4·00 @ 4·25 net

Tacks, Brads, &c.
Tacks, Half Weight American...dis 75&20%
" Full " " ....dis 50&20%
" Half " Swedes.....dis 65&20%
" Full " " .....dis 30&20%
" Carpet, Am. and Swedes..dis 20&20%
" " Leather Head.....dis 20%
" Copper.....₩ ℔ 52c, dis 20%
Brads, Half Weight.....dis 50&20%
Shoe Nails—
4-8 and larger, 9c; 3½-8, 9½c ₩ ℔. dis 20&10%
Trunk, Clout and Finishing Nails—
½ ⅝ ¾ ⅞ 1 1¼ and over
25, 30, 11, 13, 18, 11c ₩ ℔, dis 20&10%
Double Pointed Tacks.....dis 40&5%

Traps.
Genuine Oneida—Newhouse.....dis 30%
Im. Oneida—Newhouse list (1st qual.).....dis 60%

Vises.—Solid Box, Trenton.....₩ ℔ 11½ @ 12½c net

Wrenches.—
Girard (Coe's Pattern).....dis 50&10%, case 50, 10&5%
Agricultural—
₩ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5%
Coes' Genuine.....dis 50&5%
" Pat. Wrot Bar.....dis 60 @ 60&10%
" " Mall " .....dis 75%
Taft's " Wrot " .....dis 75 @ 75&10%
Phila. Tool Co., Duplex.....dis 25%

Wire.—
Bright or Ann'd, No. 0 to 18.....dis 52½ @ 55%
" " No. 19 to 26.....dis 57½ @ 60%
" " No. 27 to 36.....dis 60 @ 62½%
Coppered to 18.....dis 47½ @ 50%
Tinned Broom Wire.....dis 42½ @ 45%
Galvanized, No. 7 to 18.....dis 22½ @ 25%

Wringers.—Novelty No. 10.....₩ doz. $63·00 net
Novelty No. 2....." 66·00 net
Universal, No. 2½....." 63·00
" No. 2....." 66·00

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
Sept. 1, 1877.

Apple Parers—Bay State.....per doz $12·00
Faultless Turn Table....." 7·50
Lightning....." 7·50
Peach Parers....." 12·00
Potatoe Parers....." 12·00
Climax Corer and Slicer....." 6·00
Bells, Cow—Yaw's Genuine.....dis 50%
Braces—Bit, Spofford's Patent.....dis 50%
Brass—Sheets.....list net
Boards—Stove, Brooks' Pat.dis 40%&4 mos.; 40&5% 30 dys
Bolts—Stove.....dis 50%
Brick—Bath (box of 2 doz) Best English.....$1·12
Can Openers—Sprague's.....dis 55&10%
Cases—Parlor Coal Hod.....dis 25%
Chisels—Firmer Socket.....dis 60, 10&10%
Framing Socket.....dis 60, 10&10%
Corner Socket Chisels.....dis 60, 10&10%
Slick's Carpenters'.....dis 60, 10&10%
Castings—Malleable.....₩ ℔ 7½c
Cocks—Globe and Bibb.....dis 40%
Cutters—Meat, "Hales".....50%
Egg Beaters—"Dover".....per doz $4·00
"Family".....per doz $2·75
Elbows—Corrugated.....dis 20%
Adjustable.....dis 20%
Columbus.....dis 25%
Files—Maischoss Bros.....dis 50&10%
Fluters—Geneva Hand.....₩ doz. $15·00
Freezers, Ice Cream—"Champion".....dis 33⅓&5%
Hinges, Gate—Shepard's.....dis 45%
Hinges—Window Blind—
Shepard's and Standard.....dis 60%
Hoes, Coal—Plain, Black and Galvan'd...new list dis 25%
Funnel, Black and Galvanized....." dis 25%
Fancy and Helmet....." dis 25%
Sad Irons.....3c
Kettles—Brass.....₩ ℔. 45c
Copper, "Hand Made".....50c.
Enameled.....dis 60%
Knives, Drawing—Oval No. 1.....dis 60, 10&10%
Razor Blade.....dis 60&10%
Lanterns, Tubular—with guard.....$10·50
Without guard.....10·00
Mills, Coffee—Box and Side, common.....dis 25%
Box Union and Eagle.....dis 20%
Cut Nails, "Chesapeake," 10d.....$2·50
Horse, Ausable.....No. 5 6 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished.....add 1c ₩ ℔
" " 1000 lbs.....dis 20%
Paint—White Lead, U. S. Gov't.....₩ ℔ 9c
Pans—Dripping.....₩ ℔ 9c
Frying.....dis 50%
Rivets—Iron, Black and Tinned.....dis 40%
Screws—"American Screw Co"—
Flat Head, Iron.....dis 60&10%
Flat Head, Brass.....dis 55%
Sieves—Wood, Hoop Iron.....$1·20
Tinned.....1·50
Sifters—Ash.....$9·00 @ $12·00
Skates and Straps—White's.....dis 30%
Spoons, Iron Tinned.....dis 10%
" by the case.....dis 20%
S. S. & Co., Kitchen.....dis 35%
Plated Rogers' A No. 1.....dis 40&5%
Britannia.....dis 55%
G. S. Hall, Elton & Co.....dis 25&5%
Scales—Buffalo Scale Works.....dis 25%
Fairbanks.....dis 15%
Stove Polish—Gem.....₩ gross, $4·50
" Dixon's.....6·00
Palace.....₩ gross, $3·00 bulk, per ℔., 9c
Rising Sun.....₩ gross, $5·75
Squeezers—Lemon, Porcelain.....₩ doz., $5·40
Tacks—Half Weight Am. Iron.....dis 75&20%
Tea Trays.....dis. 15%
Thermometers—Tin Case.....dis 50, 10&10%
Tools—Tinmens'.....dis 10%
Vases—Palace Coal.....dis 25%
Vises—
Parallel, Buffalo.....dis 30%
Wire—Brass and Copper.....list net
Wire—Bessemer Steel.....dis 25%
Wringers—Novelty.....No. 2, $66·00; No. 10, $68·00
Tin Plates.—Add for each X.....2·50
10x14, IC, Charcoal.....$7·25 | 14x20 C., terne.....$6·75
12x12, " " 7·25 | 20x28 C. " 14 50
12½x17, " " 6·75 | 20x28 X. " 19·50
14x20, " " 6·75 |
Pig Tin—Straits.....20c @ 21c
Bar Tin.....22c
Solder—S. S. & Co. No. 1.....13c
S. S. & Co. Extra.....15c
Sheet Zinc—
"Lasalle".....570 ₩ ℔ 100 ₩ ℔ casks
$8·00 $8·30 ₩ 100 ℔s
Sheets.....$8·00
Babbit Metal.....₩ ℔ 12c
Iron Wire—Bright and Annealed.....dis 52½%
Coppered.....dis 47½%
Tinned.....dis 35%
Tinned Broom, {Nos. 20 21 22 } .....dis 40%
{ 20c 21c 21c }
Copper—Sheathing 14 @ 18 oz.....₩ ℔ 28c
Planished.....₩ ℔ 36c
" Boiler Sizes.....₩ ℔ 38c
Bottoms.....₩ ℔ 30c
Bolts.....₩ ℔ 32 @ 32c
Braziers' Sheets.....₩ ℔ 30 @ 32c
Sheet Iron.
18 Common.....$3 05
24 Common.....3 25
26 Common.....3 45
24 W. D. Wood & Co., Smooth Finish.....4 25
Planished.....A. B.
11c 9½c
Gen. Russia, No. 1 stained.....12c
" " clean.....12½c
Galvanized.....dis 35%
Tin Ware.
Deep Stamped Plain and Retinned.....45%
Com. " " .....dis 35%
Japanned " " .....dis 35%

CHICAGO.

(The Chicago Stamping Co., 72, 74 & 76 Lake St.)
Oct. 30, 1877.

Tin Plate.—
10x14, IC, Ch'l. Good.$ | 14x20, IXX, Ch' Best. 12 50
10x14, IC, " Best. 7·50 | 14x20, IXXX, " " . 15 00
10x14 IX, " " . 10 00 | DC, 100 Plate " " . 7 50
12x12, IC, " " . 7 50 | DX, " " . 10 00
12x12, IX, " " . 10 00 | DXX, " " . 12 50
14x20, IC, " " . 7 50 | DXXX, " " . 15 00
14x20, IX, " " . 10 00 | IC, Roofing, " " . 7 00
20x28, IC, Charcoal Roofing, Good.....14 00
20x28, IC, " Best.....14 50
20x28, IX, " " 19 00
10x14, IC, Coke Plates.....6 75
14x20, IC, " 6 75
10x20, IC, " 10 75

Block Tin.—
Large Pigs.....20c | Bars.....22c
Small.....21c

Zinc.—Sheet, 500 to 1000 ℔. Casks.....7½c
Loose Sheets.....8 c
Slab Zinc or Spelter.....7 c

Copper.—Bottoms.....30c
Sheathing.....28c
Planished.....37c
" Boiler length.....38c
Bolt.....35c

Braziers' Sheets.—
30x60, 6 to 7 lbs.....₩ ℔ 8c | 30x60, 10 to 12 lbs...₩ ℔ 32c
30x60, 8 to 9 lbs....." 34c | 30x60, 15 to 100 lbs. " c

Solder.—F. S. & Co.'s make
Best Fine.....16c
No. 1.....14c
Roofing.....12c
Braziers or Plumber Solder.....35c

Antimony.....18c

Babbit Metal—F. S. & Co.'s.....16c
No. 2.....14c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24.....	3·20c	4·20c	6 c	8 c
25 & 26...	3·40c	4·40c	6½c	8½c
27.....	3·60c	4·60c	6½c	8½c

Galvanized Iron.—
No. 16 to 20.....12c | No. 27.....15c
21 to 24.....13c | 28.....16c
25 & 26.....14c

Russia Iron.—
Perfect.....13c | No. 1 Stained.....12c
in Sheets, 1c. higher.

American Russia.—
A.....11c | B.....9½c
in sheets, 1c higher.

Lead.—
Pig.....6½c | Lead Pipe, in full coils 7½
Bar.....7½ | Lead Pipe, when cut.. 8
Sheet Lead.....8

Wire—Bright.....dis 47%
Coppered.....dis 40%

PITTSBURGH.

The following are the Card rates, f. o. b. in Pittsburgh of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St. New York, Agent.

Merchant Bar Iron.....2c rates net
Flat Rail (1¼x¼), punched and coun'sunk..3¾c ₩ ℔ net
Iron Wedges.....3¾c ₩ ℔ net
Norway Nail Rods, Vass.....7 c ₩ ℔ net
Iron Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)...4 c ₩ ℔ net
Beetle Rings.....5¾c ₩ ℔ net
Fence Pickets—
⅜ r'nd, bent to shape, 25c ₩ ft. of fence, less 15% off net
Discount off Standard List.
Carriage and Tire Bolts, $500 worth purchased in six months, ending July and Jan. 1....75, 5&3% off net
Stove Bolts.....40% off net
Elevator Bolts.....30% off net
Machine and Square Head Bolts.....60% off net
Coach and Lag Screws.....60% off net
Bolt Ends.....60% off net
Pat. Hot Pressed Sq. and Hex. Nuts.....7½c ₩ ℔ off net
Washers, all made from new band iron..7½c ₩ ℔ off net
Nuts and Washers in 25 lb. boxes, ¼c ₩ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₩ ℔ ex.
Nuts and Washers in 5 lb. boxes, 1c. ₩ ℔ ex.
Standard Caps, for Plows.....4½c. ₩ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 2¾c ₩ ℔ net; ⅞, ¾ in. diam. 2¾c ₩ ℔ net; ⅝ in. diam. 3c ₩ ℔ net.
Pat. Headed Harrow Teeth, packed in boxes, ¼c ₩ ℔ ex.
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 4½c ₩ ℔ net; 9-16 in. diam. 5½c ₩ ℔ net; ½ in. diam. 6½c ₩ ℔ net. ½c ₩ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, with Pat. Hooks, ¾ to 1 in. diam., 7c ₩ ℔ net; ⅝ in. diam., 8c ₩ ℔ net; ½ in. diam., 10c ₩ ℔ net.
Screw and Strap Hinges—all sizes under 28 in. long have Pat. Hooks, 14 to 36 in. long, 3 4-10c ₩ ℔ net; 6, 8, 10 and 12 in. long, 4 9-10c ₩ ℔ net.
Strap & T Hinges.....60&10% off net
Hereafter we will not make any allowances for freight on Strap and T Hinges; our price on them is F. O. B. in Pittsburgh.
Screw Hitching Rings, light, with ¾ ring, No. 1, $4·00 ₩ 100 net; heavy, with 5-16 ring, No. 2, $4·50 ₩ 100 net.
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long.....₩ ℔ 3¼c net
1 to 2 in. diam. from 4 to 8 ft. long....." 3¾c net
1 to 2 in. diam. from 1½ to 4 ft. long....." 3¾c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long....." 4 c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 4¼c net
Bridge bolts with upset ends.....¼c. ₩ ℔ extra
Wrought iron plates, punched.....4¼c. ₩ ℔ net
Cast Iron Washers.....₩ ℔ 3¼c net
Grass Rods.....7½c ₩ ℔ net
Heel Bolts.....8¼c ₩ ℔ net
Duck Nest Tuyere Irons.....$13·50 ₩ doz net
Wrought Iron Repair Links.....15% off net
" Rings.....50% off net
" Lap Rings.....33⅓% off net

WAGON HARDWARE.

Single Trees, Neck Yokes and Double Trees, made from best selected Hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought.....each, 38c net
No. 2 Western Plow Single Tree, Ironed complete Irons all Wrought.....each, 50c net
No. 3 Wagon Single Tree, Ironed complete, Irons all Wrought, except Malleable Ferrule.....each, 60c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against.....each, 60c net
Neck Yoke, Ironed complete, Irons all Wt., except End Ferrules, with Wt. Iron Rings.each, 70c net
Southern Plow Double Tree, Ironed complete, Irons all wrought.....each, 60c net
Wagon Box Strap Bolts—For Orders of 50 Set, 45% dis.
10 in. long by 7-16 at Screw End, ₩ set of 8 bolts.. 45c
12 " ½ " " 8 " .. 55c
10 " 9-16 " " 8 " .. 65c
12 " 9-16 " " 8 " .. 70c
14 " 9-16 " " 8 " .. 80c
10 " ⅝ " " 8 " .. 80c
12 " ⅝ " " 8 " .. 80c
14 " ⅝ " " 8 " .. 90c
16 " ⅝ " " 8 " .. 1·00
18 " ⅝ " " 8 " .. 1·10
20 " ⅝ " " 8 " .. 1·20
5c ₩ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wrought Iron Bolster Plates, 2¼ in. wide, ₩ set.....45c
" " " 3 " " 50c
" " " 3¼ " " 55c
" " " 3½ " " 60c
Wrought Hammer Straps, heavy pattern, each.....13 c
" " " light " each.....12 c
" Rub Irons, each.....9 c
Double and Single Tree Clips, figure 1, each.....8 c
" " " " 2, each.....9 c
" " " " 3, each.....11 c
Pole Caps, each.....30c
Strap Bolts, Bolster Plates, Hammer Straps, Rub Irons Clips and Pole Caps, in lots of 50 sets.....dis 45%
For each order amounting to $200 net, or over, for the following goods: Wagon Hardware, Carriage and Tire Bolts, Rivets, Skein Bolts, Nuts, Washers, Chains, Bevel Box and Tongue Cap Iron, we will allow an extra discount of 10 per cent. off all Wagon Hardware, subject to discount, comprised in the order. Jobbers who do not deal in iron, we allow to substitute Strap and T Hinges in lieu of Bevel Box and Tongue Cap Iron to make order up to $200 worth and secure the extra discount of 10 per cent.
Single Tree Hooks, Nos. 1 and 2.....each, 3½c net
Single Tree Irons, New Pattern.....each, 4½c net
Stay Chain Hooks.....each, 3¾c net
Wagon Box Rods, narrow track, with Pat. Collar.....each, 7½c net
Wagon Box Rods, wide track, with Patent Collar.....each, 8½c net
Wagon Brake Ratchets.....each, 7 c net
" " " finished with guard..each, 20c net
Single Tree Iron, Wt. Hook, Malleable Ferrule.....each, 7½ net
Single Tree Iron, Wt. ⅝ Hook and 7-16 Clip..each, 7c net
Single and Double Tree Iron, Wrought Center Clip, ⅝ in. Welded, with ½ in. Ring...each, 10c net
Southern Plow Center Clip, ½ in. Welded, and 7-16 End Clip with 5-16 in. Hook—per set of 3 pieces.20c net
Neck Yoke End Ferrule, Malleable, with Wt. Iron Ring.....each, 6½c net
Neck Yoke Attachment, with plates complete.....each, 25c net
Axle Tree Clips, No. 1.....each 2½c net
" " No. 2....." 3¼c net
" " For Farm and Lumber Wagons, Shank, 9-16 in., flat part 1¼ in.....each, 6¾c net
Plow and Wagon Clevises.....₩ ℔ 7c net
California Tire Rivets and Burrs, 5-16....." 10c net
" " " ¼.....11c net
Wagon Box Staples, 1¼ to 2¼ in. to clinch. ₩ 1000 $10·75 net
" " " Bevel Box Iron, to rivet on, ₩ 1000 7·25 net
Neck Yoke Eyes, each.....4½c net
" " with ⅝ rings, each.....7c net
King Bolts, ⅝, 1, 1⅛, and 1¼ in. diam.....₩ ℔ 3¼ net
Wagon Rivets, ex. large flat, oval and steeple head, ¼ in. diam., 1 in. and longer....." 7 c net
Wagon Rivets, 3-16 in. diam., 1 in. and longer " 8 c net
" " ¼ to 1 inch long.....₩ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes.....1c extra
" " in 25 ℔ wood " .....½c extra
Wagon and Hinge Nails, pointed by hand—
¼x8 and longer. 2½ & 2¾ 2 & 2¼ 1¾ and shorter.
11c ₩ ℔. 13c ₩ ℔. 15c ₩ ℔. 17c ₩ ℔ net
3-16x8 and longer. 2½ & 2¾ 2 & 2¼ 1¾ and shorter.
12c ₩ ℔. 14c ₩ ℔. 16c ₩ ℔. 18c ₩ ℔ net
Wagon Rivets and Nails, in less lots than one keg each size.....₩ ℔ ½c extra
Double Tree Plates.....7½c net
Coupling " .....6½c net
Tongue " .....7½c net
Neck Yoke Plates.....8½c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ₩ ℔ as No. 12 Band Iron.
Sand Band Iron, 1¼ in. wide, same price as No. 12 Band Iron.
Hub Band Iron, ¼c ₩ ℔ over price of same size Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ₩ ℔ 7c net; ¼ in., 8c net.
Our prices are all subject to change of market, without notice.

American Skate Sharpener

Is just what has long been wanted. Every skater sharpens his own skates.
It does the work complete on both groove and flat skates, without the aid of a vise and is carried conveniently in the pocket. It sells readily at sight. Every skater buys one.
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Sole Manufacturers and Proprietors.
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Hydraulic Sheet Punch,

Punches 72 Holes at once; worked by Direct Acting Steam Cylinder; also bending rolls 6 ft. 9 in. inside.

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Lumber Pencils, Foundry Facings and Lubricating Plumbago.
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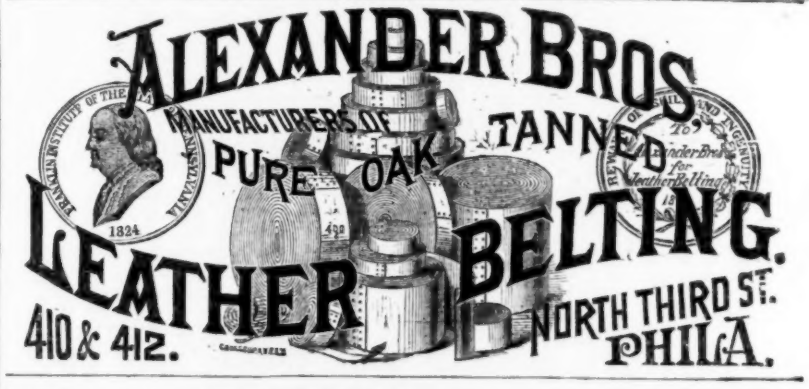

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All Belts warranted. Orders by Post immediately attended to.

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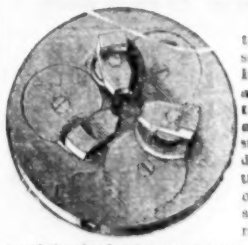
JOHNSON'S PATENT UNIVERSAL
LATHE CHUCK.



We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List address,
Lambertville Iron Works, Lambertville.

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Manufacturers' Agent in
RAILROAD SUPPLIES.
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ST. LOUIS STAMPING CO.

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All Goods Marked

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Granite Iron Ware.

EVERYWHERE

GRANITE IRON WARE IS THE ONLY SUITABLE HOUSEHOLD WARE MADE.

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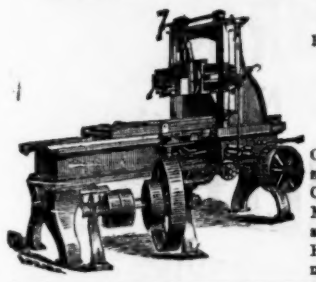
Have constantly on hand and making



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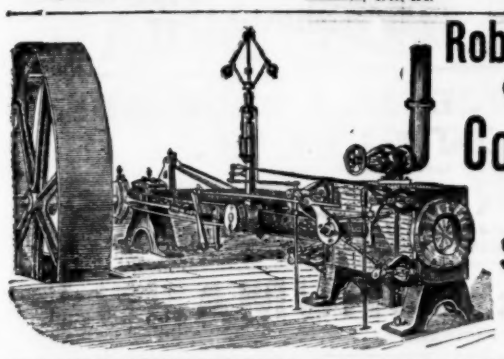

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Corliss Engine

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STEAM AND HYDRAULIC PACKING.

The results of a long series of experiment made with a view of meeting all the requirements of a Perfect Packing. And we assert without any reservation that it is the **best** article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of braids of linen, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, flute or gum the rods, no matter how long run. It has thus far received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest Packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled.

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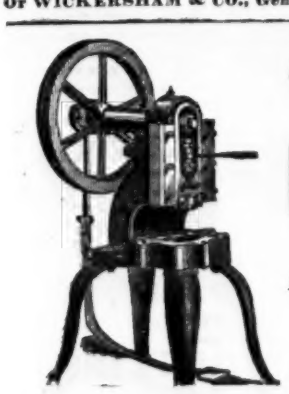

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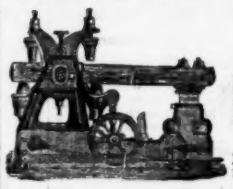

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Has Won Golden Opinions from the Mechanical World during the four years it has been before the public, and has reached a sale of 200 hammers, all in successful operation in this and foreign countries.

It Has More Good Points, Less Complication, More Adaptability, Larger Capacity, Does More and Better Work, Takes Less Power, Costs less for Repairs than any Hammer in the World. GUARANTEED AS REPRESENTED. and "DON'T YOU FORGET IT."

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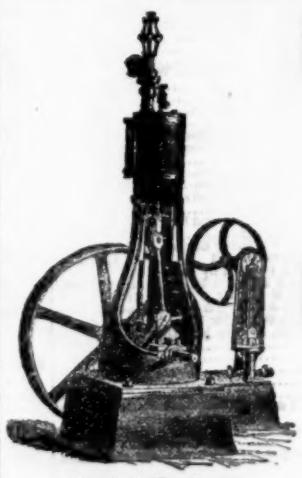

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Engines all styles on hand and made at short notice.

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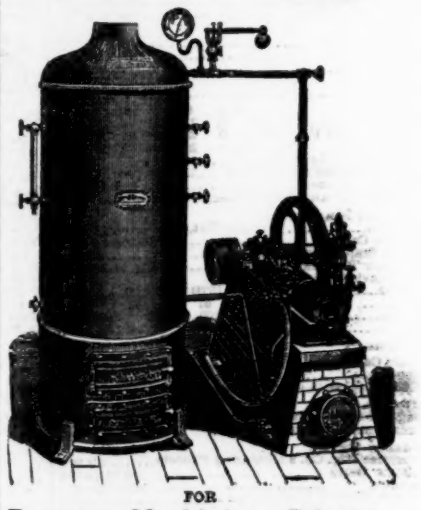

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Farmers, Machinists, Printers,

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Sizes from one to six Horse-Power.

Prices for Engine and Boiler, complete, from $150 to $450.

We make the STRONGEST BOILER and the BEST ENGINE in the country.

Call at our factory and examine, or send for free Illustrated and Descriptive Catalogue.

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$50 Screw Cutter.

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LATHES,

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Two horse-power, $150

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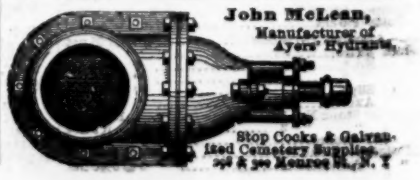

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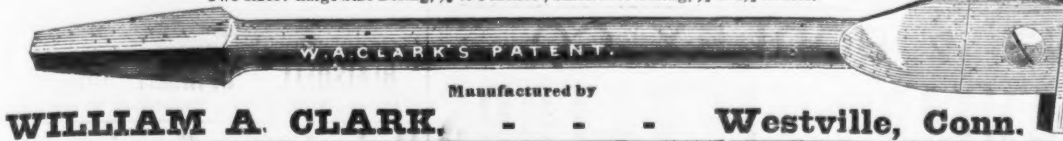
Two sizes: Large Size Boring, 7/8 to 3 inches; Small Size Boring, 1/2 to 1 1/2 inches.



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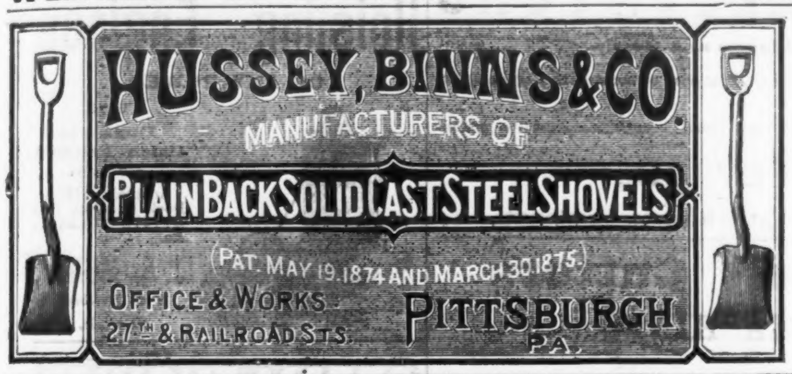

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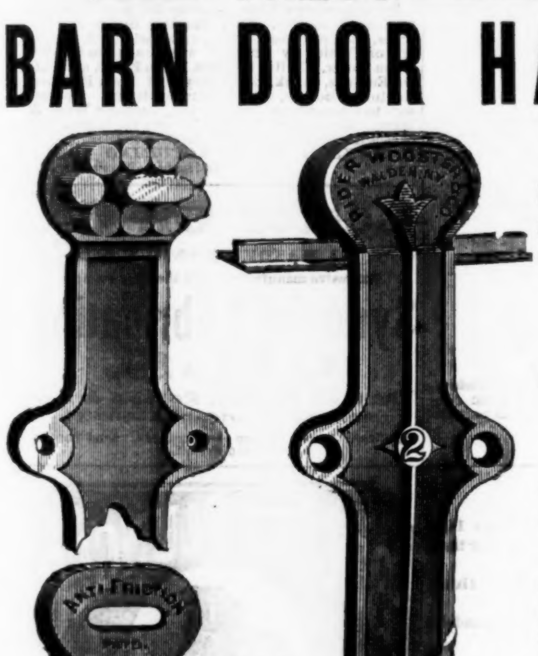

This well-known and popular Hanger is in too general use to require any description.

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Guaranteed to run twice as easily as any other style.

It is the ONLY ONE made without a Sheave or Wheel, and that will not mount the rail or run off the track.

Only two sizes made.

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Anthony & Cushman's Tacks, Brads, &c.

Depot for the Gaylord Mfg. Co.'s Cabinet Locks.

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MARTIN'S ENGLISH HORSE CLIPPERS.

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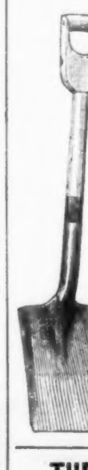
1707 Market St.,
PHILADELPHIA.

Recommended as the best Hand Clipper made.
$5.00 each. Discount to trade.

REMINGTON AGL. CO.

MANUFACTURERS OF THE LOWMAN PATENT Shovels, Scoops AND SPADES, Without Welds or Rivets.



Made only of the BEST CAST STEEL.

Every one branded in the Steel, "E. REMINGTON & SONS." None others genuine.

Plows, Hoes, Garden Rakes, Horse Rakes, Mowers and Agricultural Implements generally.

NEW YORK OFFICE, 57 Reade Street.
FACTORY, Ilion, N. Y.

BRANCH OFFICES.—47 N. Charles St., Baltimore, Md.; 811 N. Main Street., St. Louis, Mo.

THE "DUCKHAM" PATENT

Suspended Self-Indicating

WEIGHING MACHINE.

Capacities from 1 to 100 tons.

This machine is used on a crane or any lifting apparatus, and indicates the weight on the dial directly the article is lifted. It is accurate, requires no adjusting, portable, and the greatest labor-saving weigher ever introduced.

Send for Circular and Price List.

Robert King & Son.

MANUFACTURERS,

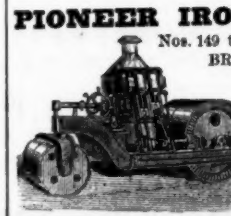
Hydraulic Presses, Accumulators, &c.

38 Gold Street, New York.

Fairmount Machine Works,
OFFICE, 2106 WOOD ST., PHILADELPHIA.
THOMAS WOOD,
Manufacturer as Specialties
POWER LOOMS,
Beaming, Spooling, Dyeing and Sizing Machines, Bobbin Winding Machines, Wind direct from the Hank to Shuttle Bobbin; Self-Acting Wool-Scouring Machines, Lard and Paraffine Oil Presses,
SHAFTING
With Patent Self-Oiling Hangers,
Pulleys from 4 inch to 10 feet in diameter,
Power Pulleys in two parts,
Hoisting Machines,
Patent Friction Pulleys.

PIONEER IRON WORKS,

Nos. 149 to 163 William Street, BROOKLYN, N. Y.



Manufacturers of the A. Lindelof Patent Steam Road Roller and Traction Engine. All kinds of Paving Machinery. Machinery for Sugar Houses and Plantations a specialty.

Alexander Bass' Patent Portable Iron Railroad.

FIRE HYDRANTS AND Eddy Valves.

All Styles and Sizes.

Made (and patents owned) by THE MOHAWK & HUDSON MFG CO., WATERFORD, N. Y.

BOSTON.

Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American"........per lb. 9c; dis 20 %
Augers.—Watrous Ship........dis 10 %
L'Hommedieu Ship........dis 15 %
Axes.—Blue Jacket........9 00
Racer........8 00
Red Cross, Handled........10 50
" " Boy's........9 00
Blue Jacket "........10 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50, B (No. 1) $2·00, C (No. 2) $1·50 ₱ doz
Blind Hinges.—Orr or Washburn's..₱ hun d sets $6 50
Blind Fasts.—
Orr or Washburn's........per hundred set $4 50
Bolts.—Carriage, Phila........dis 60&20 %
Carriage Common........dis 75 %
Borax.—Best Refined........₱ lb 11c
Borers.—Angle, Backus'........dis 30 %
Boring Machines.—Angle........each $4 50
Common, Snell's quality........each 3 50
Braces.—Barber's........dis 40&5 %
Backus'........new list 50&10
Spofford's........dis 50 %
Bracket
Saw Frames, with patterns complete........₱ doz $6 00
Saws........" 88
Saw Frames, Centennial........" 3 50
Star Bronzed........new list net
Star Japanned........new list net
Store Shelf........new list net
Brass Faucets.—L. F. & C........dis 40 %
Brushes.—Horse, Patent Metallic........per doz. $4·50
Butts.—Union Drilled Loose Joint........dis 62½ & 10 %
" " Wire Fast Joint........dis 45&10 %
" " Acorn Loose J't........dis 62½&10 %
Brass Butts........dis 30 %
Wrought Table Butts and Back Flaps ....revised list, dis 35 %
Wrought Narrow Butts........reduced, dis 40 %
Cards.—
Curry Cards, No. X, per doz., $0·75........dis 20 %
Horse " No. X, " 0·80........dis 30 %
Wool " No. 8X, " 2·50........dis 15 %
Cotton " No. 10, " 3·50........dis 10 %
Cartridges.—U. S. Cartridge Co........dis 60 %
Chisels.—"Buck Bros." Shank Goods........dis 20 %
Socket........dis 25 %
Compasses and Dividers.—Bemis'........dis 40 %
P. S. & W........dis 20 %
Cordage.—Manila (usual trade dis.)........₱ lb 14c
Corn Hooks........per doz $2·75
Crow Bars.—Solid Steel........₱ lb, 9c
Cow Ties........dis 30 %
Dividers.—Cook's Nickel Plated........dis 15 %
Door Springs.—Moseley—
Per doz........$9·00 12·00 15·00 18 00 24·00
No........0 1 2 3 4
Torrey's........$2·50
Gem........dis 10 %
Drills.—Whitney's with Chucks........$12·50
Emery.—Alden........₱ lb 7c
Wellington Mills........₱ lb 10c
Files.—American........dis 30 %
Nicholson, new list........dis 30 %
Wheeler, Madden & Clemson........$5 to £; 10 %
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·68, $1·88; 4½, $2 13; 5, $2·50
Hammers.—Maydole—new reduced list........dis 15 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $8·75........dis 25 %
M., B. & D., solid cast steel, bell face, No. 1, $11; 1½, $9·75.
Hammond—new reduced list........dis 15 %
Hangers & Rollers.—Anti-Friction........dis 40 %
Climax........dis 40 %
Acme Rollers........dis 40 %
Hatchets.—Underhill Edge Tool Co........dis 25 %
C. F. Dowse, warranted Cast Steel—
Shingling........0, $4·75; 1, $5·25; 2, $5·75
Claw........1, 5·75; 2, 6·25
Lathing........1, $5·50
Axe Pattern........1, $7·00; 2, 7·50
Broad....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75
Hinges.—Strap and T Stanley Works........dis 60 %
Plate, Loose and Fast Joint........₱ lb 5c
Wrought Screw Hook........₱ lb 5c
Knobs.—Imp. Extension Silvered Glass....₱ doz $8·00
Lanterns.—Tubular No. 0........$10·00
Guarded, No. 74, (with kerosene oil and candle burners)........5·50
Lead.—Sheet, 8c.; Pipe, 7½c........dis 10 %
Locks.—Norwalk Lock Co........dis 50 %
Mattocks.—
K. P. & Co. axe finish, long cutter........$11 50—net
Short cutter........11 00—net
Meat Cutters.—"Miles's" Challenge........dis 30 %
No. 1, $22·00; 2, $30·00; 3, $40·00.
Metal.—Babbitt........No. 1, 35c; 2, 25c; 5, 15c ₱ lb
Nails.—10d and larger........$2 50
Nail Pullers.—Little Giant—Small....per doz., $22·00
Little Giant—Large........" 30·00
Padlocks.—Wilcox........dis 33⅓&5 %
Picks.—K. P. & Co., Solid Eyes........5 to 6 $9 00; 6 to 7 $9 50
Pins.—Universal Hat and Coat all wood—
2 in........₱ gross $2·50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Planes.—Auburn Tool Co........dis 40 %
N. Y. Tool Co........dis 50 %
Plated Ware.—Rogers Bros........dis 40 %
Pocket Knives.—Conn. Cutlery Co........new net list
American Shear Co........new net list
Plumb & Levels.—Stanley........dis 60&10 %
Pulleys.—Axle.
Fr'me pol. wh'l pt. face No. 15, ¾ in., 20c.; 16, 2 in., 26c.
Pol. wh'l br'zed face No. 115, 1¾ in., 20c.; 116, 2 in., 26c.
Pulley Blocks.—"Best Boston Make"........ne
Rail Barn Door.—For Novelty and Anti-Friction Hangers........per foot 7c.. dis 40 %
Refrigerators—Heinz Patent........dis 20 %
Rivets.—Black........dis 40 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8. dis 30 %
13 13 14 14 15 16c ₱ lb
Sad Irons.—Bless & Drake........₱ lb 3½c
Sand Paper........dis 15 & 5 %
M. B. & D........0 to 2, $4·25; 2 to 3, $4·75
Saws.—*Hand and Panel*—
X Cut, Wheeler, Madden & Clemson........per ft., 35c
" Champion........" 45c
" Lightning........" 45c
" Great American........" 50c
Wood Saws, Welsh & Griffith........₱ doz $14·00
Wheeler, Madden & Clemson's, same list as "Diston's"........dis. 20 %
Disston's........dis. 20 %
Saw Horses.—Extra........₱ doz $2·25
Folding........" 3·50
Screws.—Am. Screw Co., new list Sept. 1st dis 60&10 %
Aiken's........dis 60&10 %
Scythe Stones.—
"Willoughby Lake," first quality........₱ gross $4·50
" second quality........" 3·00
Shovels.—O. Ames........dis 30 %
M. B. & D........dis 30 %
Spading Forks.—W. C. & Co........dis 40 %
Tools.—Aiken's Pattern........₱ doz $8·00
Aiken's Genuine, $12........dis 40 %
" " Saw Sets, $18........dis 40 %
Traps.—Oneida........dis 25 %
Blake's........dis 40 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith....₱ lb 12c
Parker's Parallel........dis 10 %
Backus........dis 25 %
"Howards," Parallel........dis 25 %
Wardrobe Hooks.—Wire to drive........₱ gross $1 00
Weights.—Window Weights........₱ lb 1½
Wedges—Axe........₱ doz $3
Wire.—
Eureka in spools, No. 28 to 40 assorted....₱ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, 4½c
Drab or Black........₱ ft 4½c
Wrenches.—Genuine Wrenches, G. A. Coes........dis 50 %
"Girard"........dis 50&10 %
Wringers.—Universal XX No. 2........₱ doz $66 00
Novelty, No. 10........" 63 00
" No. 2........" 66 00
" No. 22........" 70 00
Excelsior A, with bench........" 84 00
" E, set tubs........" 72 00
Eureka........" 57 00
Welcome........" 60 00
Withington, Cooley & Co.—Hoes, Rakes, Forks &c. dis 40 %. Special rate for Export.

Crow Bars.—Steel Pointed........₱ lb 8c
Drag Saw Machines.
Culver's Pop Drag Saw........dis 20 %
Excelsior Drag Saw with Log Trucks........dis 20 %
Fanning Mills.—Nash & Cutt's........dis 25 %
Feed Cutters.—Burdick National........new list, net
Sanford No. 1, $10 00; No. 2, $8 00........net
Bowman's Lever Cutter, $6·50........net
Files.—Black Diamond, Mill........$4·50 £ currency.
" Bastard........4 50 £ currency.
" Taper........4·50 £ currency.
Forges and Blowers.
Keystone Portable Forge Co.'s........dis 10 %
Forks and Hoes.
Auburn Mfg. Co.'s Hay and Manure Forks new list........dis 15 %
Auburn Mfg. Co.'s Handled Hoes....new list, dis 15 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe........new list, dis 20 %
" Planet Drill, Nos. 2 and 3........new list, dis 20 %
" Combined Drill and Wheel Hoe "........dis 20 %
Grinding Mills.—Challenge Feed Mills........dis 15 %
Sedgebeer's Nonpareil Mills........dis 15 %
Bradford's French Burr Mills........dis 5 %
Hammers.—Masons' Hammers........₱ lb 18c
Smiths' Hand........" 15c
Handles.—No. 1 Fork, Hoe and Rake.new list, dis 25 %
No. 2 Fork, Hoe and Rake........new list, dis 25 %
Ax, Pick, Sledge and Small Handles........net list
Hay and Cotton Presses.
Dederick's Railroad........dis 10 %
" Perpetual........dis 10 %
Hay Knives.
Dunn Edge Tool Co.'s........₱ doz $12 00 net
Lightning (Weymouth's Patent)........₱ doz $19 00
Horse Nails.—National Patent Pointed........20c rate
National Patent Pointed, extra finished........22c "
Horse Powers.—Pitts or Carey's Patent........dis 10 %
Wheeler's Railway........dis 10 %
Sandwich Lever........dis 10 %
Hose.—
Boston Belting Co.'s Rubber Medium Sizes.dis 10&10 %
" " " S. Siz. Hydrant..dis 40 %
Mattocks and Grub Hoes.
Klein, Logan & Co.'s Mattocks....₱ doz $11 25 @ 11 60
" Grub Hoes, oval eye "........8 30 @ 9 25
Money Drawers.—
Pierpont & Co.'s Excelsior........per doz $33·00 net
Nails.—Wheeling Riverside Brand........$2 50 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure........dis 25&5 %
" " No. 3 Plain........dis 40 %
" Round and Square....dis 10&10 %
Picks.—Railroad and Clay.....₱ doz $8 00 @ 9 75 net
Coal........" 6 30 @ 7 25 net
Poll........" 9 45 @ 18 15 net
Stone........" 11 00 @ 11 60 net
Tamping........" 11 75 @ 12 25 net
Miners Drifting........" 7 80 @ 9 60 net
Plows.—Avery's Cast and Steel........new list, dis 20 %
Avery Sulky Plow........new list, dis 20 %
Collins Cast Cast Steel........new list net
Pekin Steel........dis 25 %
Plow Sulky.—Buckeye........$27 00 net
Post Hole Augers.—Clark's Patent—
No. 1, ₱ doz. $27; No. 2, $30; No. 3, $32........dis 25 %
Pulleys.—5 inch........per doz $3·70 net
4 inch........per doz 2 50 net
Pumps.—St. Louis, Farm, Patent Metal Lined..dis 30 %
Rakes.—Advance Sulky........each $24 00 net
St. Louis Revolving 14 tooth........4 45 net
" " 16 "........4 65 net
" Hand Hay Rake........per doz $2·50
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives........dis 40 %
" " Sections........dis 40 %
Road Scrapers.—Steel........each $8·00
Cast Iron........dis 10&5
Saws.—Curtis & Co........dis 15 %
Scythes.—Dunn Edge Tool Co.'s........dis 35 %
Scythe Stones.—No. 1 Ind'n Pond ₱ gr's, $7 00
Extra Indian Pond........" 7 50
Premium........" 10 50
Diamond Grit........" 13 00 } dis 2 %
Shovels and Spades.—Groom Shovel Co...dis 40 %
Grain Scoops—Patent Cor'd Straps Groom Shovel Co ....dis 40 %, and 50c per doz extra
do. M. Rowland & Co., dis 30 % and 50c "
do. O. Ames & Son, dis 27½ % and 50c "
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished........₱ lb 14c net
Solid Cast Steel........" 10c net
Snaths and Cradles.—Seymour Mfg. Co.'s..dis 25 %
Sorghum Machinery.—Bell Cane Mills........dis 30 %
Scantlin's Seamless Pans and Evaporators........dis 20 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express........₱ lb 14½
Blue Seat Springs........₱ pair. 90c
Thimble Skeins.—Whitewater's........dis 40&10 %
Vises.—Wilson Mfg. Co.'s........₱ lb 14½c
Wheelbarrows.—Champion Iron Wheel..₱ doz $49·50
Champion Wood Wheel........₱ doz 27·50
" Garden........₱ doz. 39·00
Wagons.—Whitewater Farm Wagons—
Thimble Skein—
2¾ in, $66; 3 in. $67.50; 3¼ in. $70; 3½ in. $71
Wire Bale Ties.—Buckeye Double Twist........net list
Dederick Adjustable........new list, dis 25 %

ST. LOUIS.

Corrected weekly by Semple & Birge Mfg. Co.

Animal Pokes........$7·50 ₱ doz. net
Apple Parers.—Conqueror........₱ doz $7 75
Hudson's Rotary........" 7 75
Axes.—Wm. Mann's, Red Warrior........₱ doz 9 75
"C. Marshall"........" 9 25
Handled........" $3 extra
Double Bitted........" 19 50
Hunt's........" 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles........dis 30 %
Common Axles (Pat. Lubricating), 1¼ inch and upward........₱ lb. 6c
do. less than 1¼ inch........" 6½c
Babbitt Metal.—
Nos........4 3 2 1 A 1 Genuine.
9½ 11 16½ 20 31 34c ₱ lb.
Bellows.—Best St. Louis make, new list....dis. 12½ %
Bells.—Troy, Church, School and Farm Bells..₱ lb 30c
"Improved Amalgam Bronzed." 15 in., $2·00; 17 in., $2·50; 19 in., $4; 21 in., $5; 24 in., $14
Belting.—"Boston Belting Co.'s" Rubber.. dis 50&10 %
Bradford & Sharp's" Oak-Tanned Leather........dis 25 %
Boilers.—Farmer's Profit Feed Boilers........dis 30 %
" Caldrons........dis 25 %
" Sugar Kettles........dis 30 %
Bolting Cloth.—New gold list........net
Bolts.—Arms, Bell & Co.'s Carriage & Tire........dis 75 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint........dis 45 %
Broad Fast Joint........dis 55 %
" Loose "........dis 60 %
Reversible........dis 60 %
" Japanned and Silver Tipped........dis 60 %
Loose Joint "Acorn" "........dis 60 %
Churns.—Julien, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50........dis 25 %
Cider Mills.
Buckeye Senior $27·00; Buckeye Junior, 18·00....net
Corn Knives.—Dunn Edge Tool Co.'s Clip...₱ doz 4 50
Seymour Mfg. Co.'s Solid Steel Back........" 4 50
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers........dis 10 %
Hand Shellers........Special rates
Cotton Gins.—Carver, with 10 in. Saws, $3 25 a saw, net
12 in. saws, $4.00 a saw........net

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 7 75	DX, 12½x17, B. Char.	$10 25
IX, 10x14, "	10 25	DXX, 12½x17 "	12 75
IC, 12x12, "	7 75	DXXX, 12½x17 "	15 25
IX, 12x12, "	10 25	IC, 20x28, "	15 00
IC, 14x20, "	7 75	IX, 20x28, "	22 50
IX, 14x20, "	10 25	IXX, 20x28, "	28 00
IXX, 14x20, "	12 75	IC, 14x20, Best Roof..	7 25
IXXX, 14x20, B. Char.	15 25	IX, 14x20, "	9 75
IXXXX, 14x20, "	17 75	IC, 20x28, "	15 00
IC, 12x24, "	8 00	IX, 20x28, "	19 50
IC, 14x14 "	15 25	IC, 10x14, Best Coke..	6 75
IX, 14x14, "	18 25	IC 14x20, "	6 75
IXX, 14x14, "	21 25	IC, 10x20, "	11 00
DC, 12½x17, "	7 75		

Sheet Iron.	Com'n.	S L U Sm'th.	D. Ref'd Sm'th.	Juni'a Sm'th
No. 16 to 20	3·20c	4·2c	6 c	7·9c
No. 22 to 24	3·20c	4·2c	6 c	7·9c
No. 26	3·40c	4·4c	6½c	8·1c
No. 27	3·60c	4·6c	6½c	8·3c

Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12........per lb. 13½c
No. 1 Stained—No. 9, 10, 11, 12........per lb. 12½c
Tare 22 lbs. to Bdle. For less than Bdle. add 1c. ₱ lb.
Patent Planished Iron.
No. 24 to 27, A quality........per lb. 11c
" B "........" 9½c
For less than Bdle. add 1c. per lb.
Galvanized Sheet Iron.
Juniata, or 1st quality........dis 35 %
Block Tin.
Banca, Large Pigs........23c | do. Small........21c
Straits, Large Pigs........20c | Bar........22c
Eng. Ref'd, Large Pig........21c
Solder.
Extra in Bars........14c | No. 2, in Bars........8c
No. 1, in "........13c | Spelter Solder........26c
Pig Lead—Pigs........7c | In Bars........8c
Antimony........15c
Bismuth........$2 75
Nickel........3 00
Crucibles.—Dixon's........₱ No. 5c
Babbit Metal.
No. 1........₱ lb. 18c | No. 3........₱ lb 13c
" 2........" 16c | " 4........" 8½c
Copper.
Brazier's, 30x60, 14 to 100 lbs. Sheets........30c
" " 10, 11 & 12 lbs., "........32c
" " 8 and 9 lbs. "........34c
" " 6 and 7 lbs. "........35c
Tinned, 14x48, 14 and 16 oz........30c
Planished, 14x48, 14 and 16 oz........38c
" Boiler Sizes. 14 and 16 oz........4 c
Gutter Copper, 20 and 24x72, 10, 11 and 12 lb. Sheets........32c
" 14 lb. Sheets........30c
Reservoir Copper, 16x60 and 18x60........33c
Bar Copper, Square and Round, ½ to 1½ inch........31c
" " " ⅜ inch........34c
Copper Bottoms........30c
Soldering Coppers........32c
Brass.
Roll, No. 10 to 28, 12 in. in width........30c
" 30, 12 in. in width........31c
" 32, 16 "........30c
" 34, 16........27c
" 36, 16........35c
Platers, No. 40, 6........58c

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper.
No. 0 to 20	34c	45c	No. 24	39c	50c
" 21	35c	46c	" 25	42c	53c
" 22	36c	47c	" 26	44c	56c
" 23	37c	48c	" 27	46c	60c

Brass Spring Wire, 2c. ₱ lb advance.
Brass Tubing.
Plain to No. 20........45c | 5-16 inch........60c
⅜ inch........50c | ¼ "........85c
Copper Rivets and Burs........dis 10 %
Brass Kettles........₱ lb 43c
Sheet Zinc.—600 lbs. cask........" 8c
250 lbs. cask........" 8½c
Sheet........" 8½c
Wire.—Iron, Bright Market........dis 50 %
Iron, Coppered Market........dis 45 %
Fence, Nos. 7, 8 and 9........₱ lb 4½c
Trellis, Nos. 10 and 11........" 5
" No. 12........" 5 ½
Hay Baling, Charcoal, No. 10 and 11........" 5½c
" " No. 12........" 5½c
Broom, Tinned, Nos. 18 to 22........" 12c
Fence Staples........per keg 6c
Per lb........6½c
Iron Rivets.—Black, papered........dis %
Tinned, papered........dis
In bulk.....new 3-16 ¼ 5-16 ⅜ in diam
11½c 10½c 10 c 9½c per lb.
Sad Irons........₱ lb 3½c
Enameled Kettles.—Standard Mfg. Co....dis %
Enameled Sauce Pans.
Standard Mfg. Co........dis %
Enameled Boilers.—Standard Mfg. Co....dis %
Dripping Pans.—Smooth Iron........₱ lb
Geneva Fluters........per doz $15 00
Monroe Fluters........" 14 50
Stove Polish.—Dixon's........pe gross 6 00
Gem........" 4 50
Japanese........" 3 50
Dixon's, in bulk........₱ lb 10
Coffee Mills.—Parker's........dis 20 %
Granite Iron Ware........dis 25 %
Spoons.—New list........dis 10 %
Retinned Iron Ware........45 % off
Plain Stamped Ware........55 % off
Japanned Ware.—St. Louis list........dis 40&5 %
Fry Pans........dis 30 %
Ears........dis 30 %

THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge ***High Prices*** for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

FEBRUARY 1, 1877.

☞ For dimensions of Governor, see Illustrated Price List.

THE JUDSON PATENT

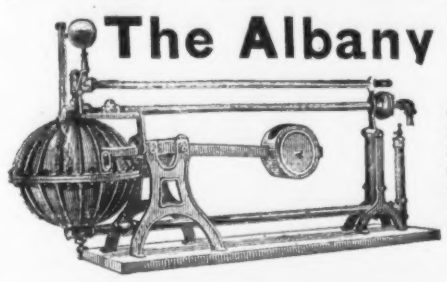
Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Spe'd'r	Stop Valve.
½	$16·00	$18·00	$1·90	..
¾	18·00	20·00	1·90	..
1	20·00	22·00	2·00	$5·00
1¼	23·00	26·00	2·25	6·00
1½	26·00	30·00	2·50	8·00
2	31·00	35·00	2·75	10·00
2¼	36·00	41·00	3·25	12·00
2½	40·00	45·00	3·50	14·00
2¾	45·00	51·00	3·75	16·00
3	50·00	57·00	4·25	19·00
3½	59·00	67·00	4·50	23·00
4	69·00	78·00	5·00	28·00
4½	80·00	90·00	5·50	34·00
5	90·00	101·00	6·00	40·00
5½	105·00	117·00	6·50	46·00
6	120·00	133·00	7·00	54·00
7	142·00	156·00	8·00	65·00
8	175·00	192·00	9·00	79·00
9	198·00	218·00	10·00	..
10	210·00	240·00	12·00	..

No Charge for Boxing & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Albany Steam Trap.



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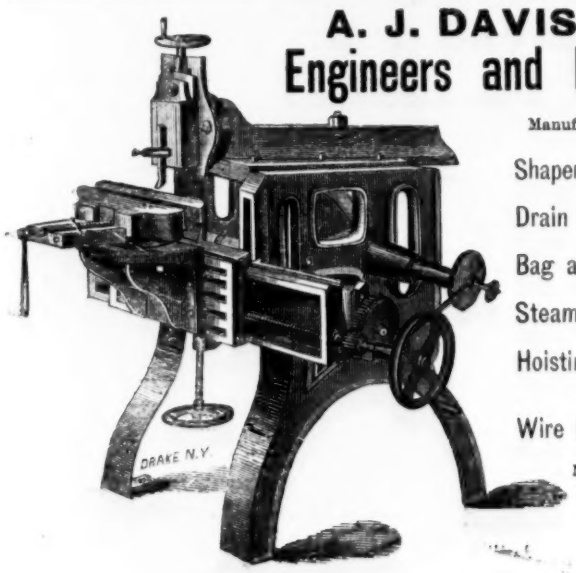

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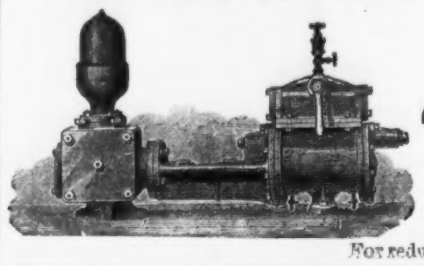

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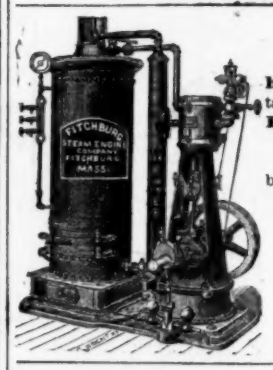

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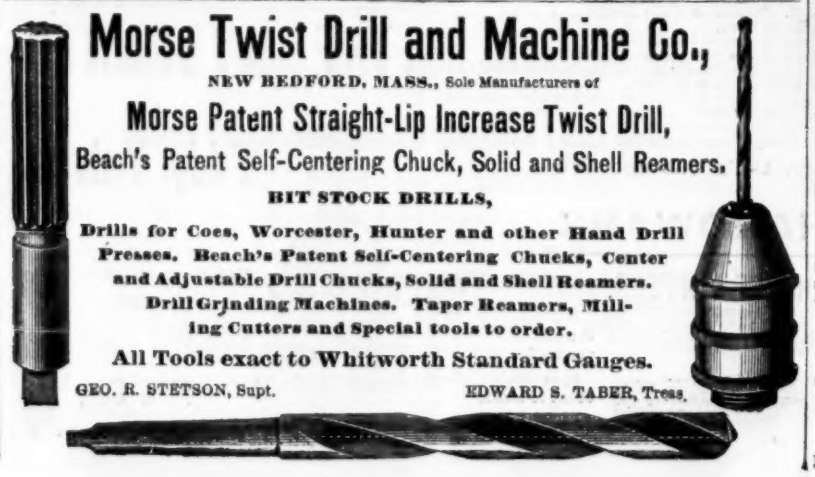

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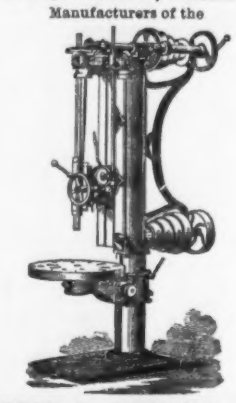

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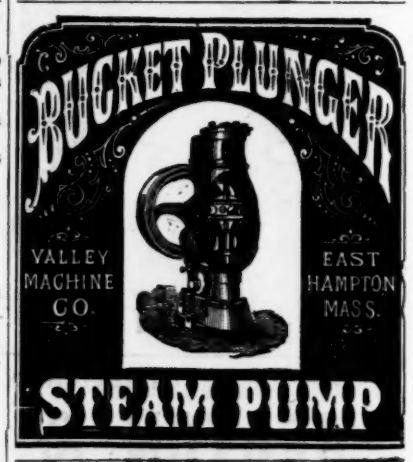

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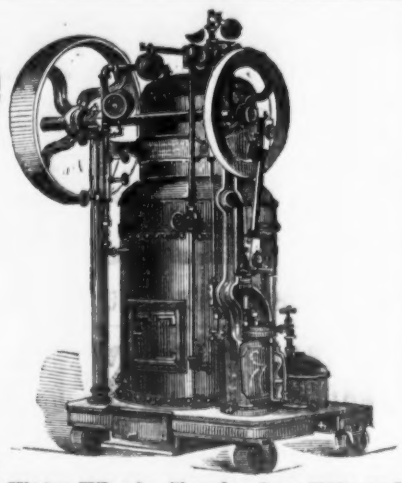

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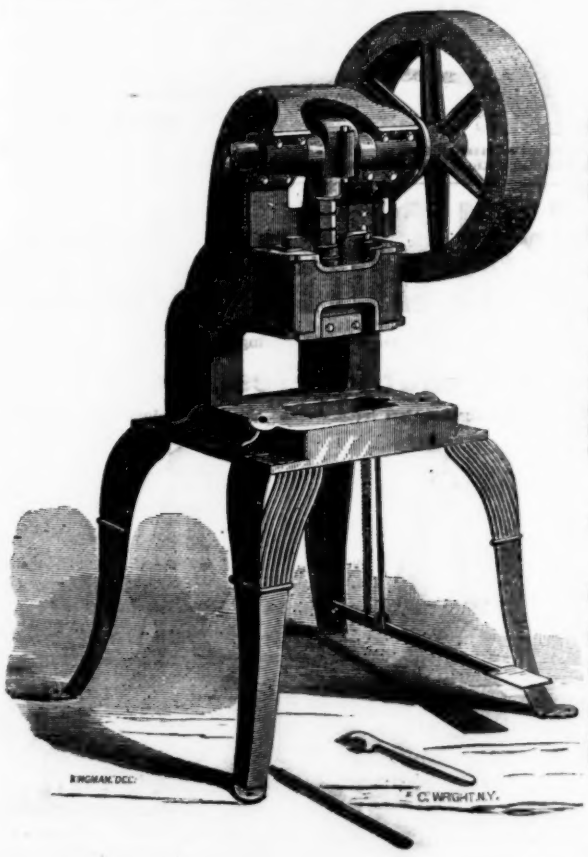

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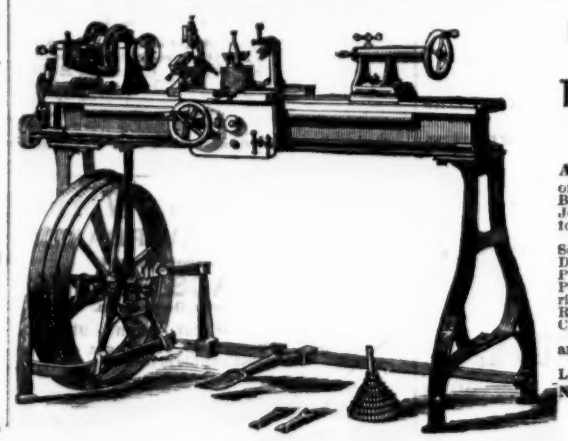

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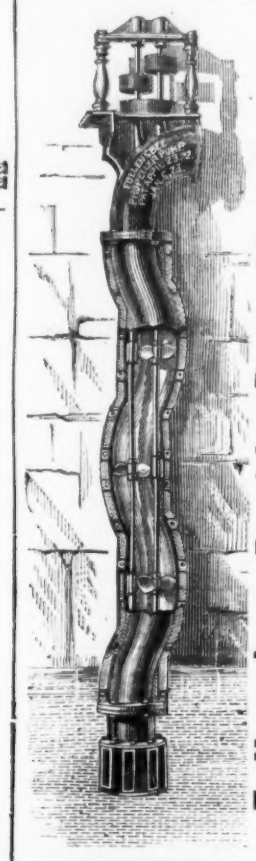

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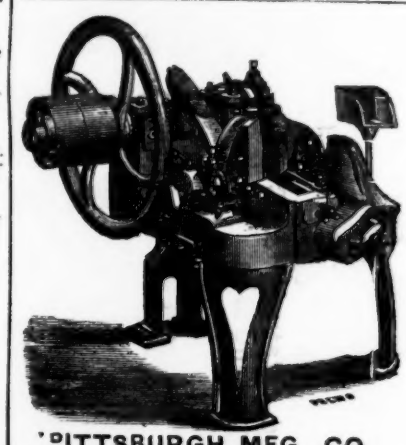

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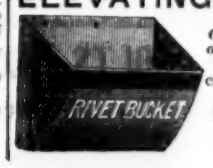

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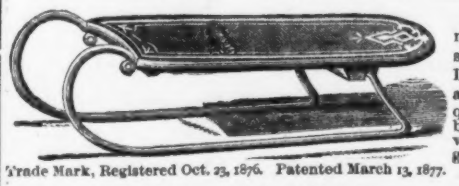

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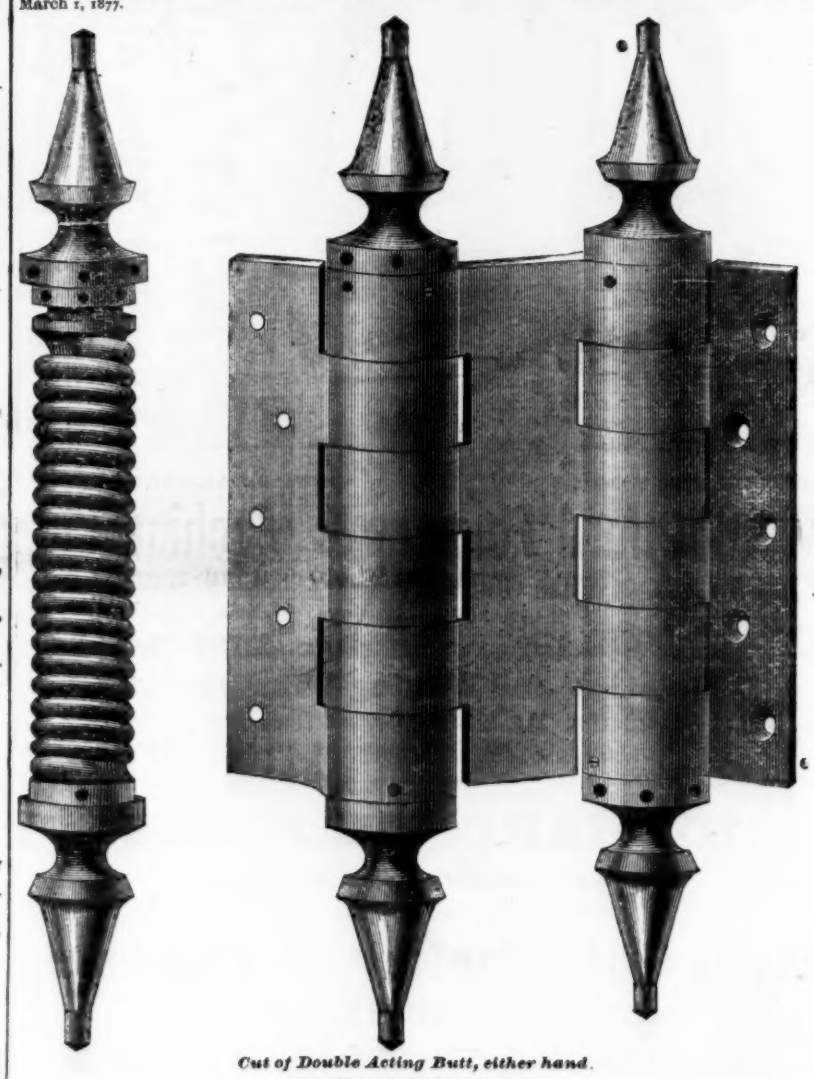

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